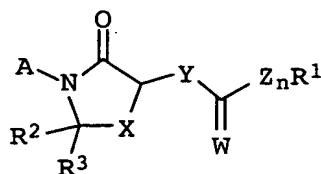


1-Phenylpyrrolidine-2-one-3-carboxamides

The present invention relates to 1-phenylpyrrolidin-2-one-3-carboxamides and their agriculturally useful salts, to compositions comprising such compounds and to the use of the 1-phenylpyrrolidin-2-one-3-carboxamides, of their salts or of compositions comprising them as herbicides.

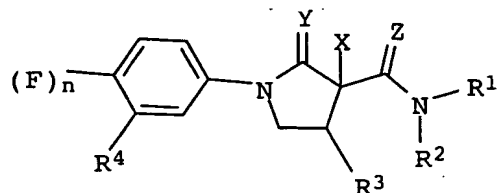
WO 95/33719 describes 1-arylthiazolidinones, 1-aryloxazolidinones and 1-arylprrrolidinones of the formula:



where A is an aromatic or heteroaromatic radical, n is 0 or 1, X is in particular S, O or CH₂, Y is in particular S, O, CH₂ or CH(CH₃) or a group NR⁶, Z is in particular NH or O, R¹ is preferably selected from unsubstituted or substituted alkyl, alkenyl, alkynyl, unsubstituted or substituted cycloalkyl, unsubstituted or substituted phenyl, benzyl or hetaryl, acyl, alkoxy carbonyl alkyl and silyl, R² and R³ are in particular hydrogen and R⁶ is inter alia hydrogen, formyl, unsubstituted or substituted alkyl, alkenyl, alkynyl, cycloalkyl or unsubstituted or substituted aryl.

WO 95/33718 describes 1-phenylpyrrolidinethiones having herbicidal activity which, in the 3-position of the pyrrolidinethione ring, contain a group O-C(O)-NR¹R² where R¹R² are, for example, hydrogen, an unsubstituted or substituted hydrocarbon radical or hetaryl, or together with the nitrogen atom to which they are attached form a heterocycle.

Furthermore, US 4,874,422 discloses herbicidally active 1-phenylpyrrolidin-2-one-3-carboxamides of the formula A



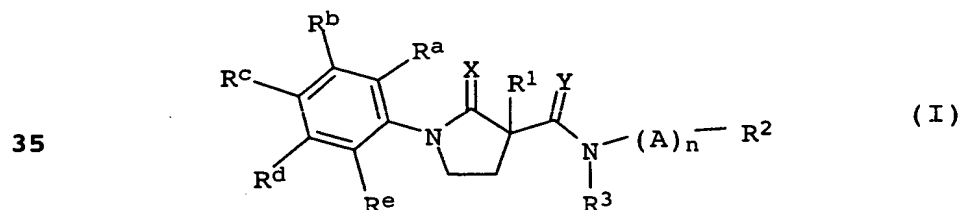
(A)

where X is hydrogen or halogen, Y and Z independently of one another are O or S, n is 0 or 1, R¹ is hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, alkoxy, phenyl, halophenyl, benzyl, halobenzyl, or alkyl which is substituted by alkoxy, alkylthio, phenyl, hydroxyl or cyano, R² is hydrogen or alkyl, R³ is alkyl or alkenyl and R⁴ is selected from the group consisting of hydrogen, halogen, methyl, trifluoromethyl, 1,1,2,2-tetrafluoroethyl, 1,1,2,2-tetrafluoroethoxy, difluoromethoxy, trifluoromethoxy, methylsulfonyl, methylsulfinyl, methylsulfonyl, methoxyiminomethyl, methoxyimino-1-ethyl, benzyloxyiminomethyl and benzyloxyimino-1-ethyl.

The herbicidal activity of the 1-arylpyrrolidinones described in the prior art is not always satisfactory. Their selectivity for harmful plants is unsatisfactory, too. In particular, even at low application rates, such herbicides tend to interfere with the generation of chlorophyll even in crop plants, which is undesirable in principle and may lead to yield losses.

It is an object of the present invention to provide novel herbicidally active compounds which allow a better targeted control of unwanted plants than the known herbicides. Advantageously, the novel herbicides should be highly active against harmful plants. Moreover, high compatibility with crop plants is desirable. Moreover, the compounds should have no adverse effect on the chlorophyll synthesis in crop plants.

We have found that this object is achieved by 1-phenylpyrrolidin-2-one-3-carboxamides of the formula I defined below and their agriculturally useful salts:



where the variables R¹, R², R³, X, Y, A, n, R^a, R^b, R^c, R^d and R^e are as defined below:

R¹ is hydrogen, OH, Cl, Br, C₁-C₆-alkyl, C₃-C₆-cycloalkyl, C₃-C₆-alkenyl, C₃-C₆-alkynyl, C(O)R⁴ or OC(O)R⁴;

R² and R³ independently of one another are hydrogen, C₁-C₁₀-alkyl, C₃-C₁₀-cycloalkyl, C₇-C₁₀-polycycloalkyl, C₃-C₈-alkenyl, C₃-C₁₀-alkynyl, C₅-C₁₀-cycloalkenyl, C₃-C₈-cycloalkyl-

C_1 - C_4 -alkyl, phenyl or 3- to 7-membered heterocyclyl, where the 9 last-mentioned groups may be unsubstituted, partially or fully halogenated and/or contain 1, 2 or 3 radicals selected from the group consisting of OH, CN, NO₂, COOH,
 5 C_1 - C_6 -alkyl, C_1 - C_6 -haloalkyl, C_1 - C_6 -alkoxy, C_1 - C_4 -haloalkoxy, C_2 - C_6 -alkenyl, C_2 - C_6 -alkynyl, C_1 - C_6 -alkylthio, C_1 - C_4 -haloalkylthio, unsubstituted or substituted phenyl, COOR⁵, NR⁶R⁷, C(O)NR⁸SO₂R¹³, C(O)NR⁸R⁹ and 3- to 7-membered heterocyclyl, and each heterocyclyl may contain 1, 2 or 3 heteroatoms
 10 selected from the group consisting of oxygen, nitrogen, sulfur, a group NR¹⁰ and a group SO₂, and, if appropriate, 1, 2 or 3 carbonyl groups and/or thiocarbonyl groups as ring members; and/or may contain a ring-fused phenyl ring which is unsubstituted or substituted; or

15 R² and R³ with the group N-(A)_n to which they are attached form a saturated 3- to 7-membered heterocycle which, in addition to the nitrogen atom, may contain 1, 2 or a further 3 heteroatoms selected from the group consisting of oxygen,
 20 nitrogen, sulfur and a group NR¹⁰ and, if appropriate, 1, 2 or 3 carbonyl groups and/or thiocarbonyl groups as ring members;

R^a, R^b, R^c, R^d and R^e independently of one another are hydrogen, OH, CN, NO₂, halogen, C_1 - C_{10} -alkyl, C_3 - C_6 -cycloalkyl,
 25 C_2 - C_6 -alkenyl, C_2 - C_6 -alkynyl, C_1 - C_6 -haloalkyl, C_2 - C_6 -haloalkenyl, C_1 - C_6 -alkoxy, C_1 - C_4 -haloalkoxy, C_1 - C_6 -alkylthio, C_1 - C_4 -haloalkylthio, C(O)R⁴, COOR⁵, NR⁶R⁷, C(O)NR⁸R⁹, S(O)₂NR⁸R⁹, S(O)R¹¹, S(O)₂R¹¹ or C_1 - C_4 -alkoxy- C_1 - C_6 -alkyl; or

30 two adjacent radicals R^a to R^e together with the atoms to which they are attached form a 5-, 6- or 7-membered saturated or unsaturated ring which may contain one or two heteroatoms selected from the group consisting of nitrogen, oxygen,
 35 sulfur and a group NR¹⁰ as ring-forming atom and/or may carry one, two, three or four radicals selected from the group consisting of halogen and C_1 - C_4 -alkyl;

X, Y independently of one another are oxygen or sulfur;

40 n is 0 or 1;

A is O, S(O)_k or NR¹², where k is 0, 1 or 2;

45 R⁴, R⁸, R⁹ independently of one another are hydrogen or C_1 - C_4 -alkyl;

R⁵, R¹¹ are C₁-C₄-alkyl;

R⁶, R⁷ independently of one another are hydrogen, C₁-C₆-alkyl, C₃-C₆-alkenyl, C₃-C₆-alkynyl, C(O)R⁴, COOR⁵ or S(O)₂R¹¹;

5

R¹⁰, R¹² independently of one another are hydrogen, C₁-C₆-alkyl, C₃-C₆-alkenyl or C₃-C₆-alkynyl; and

10 R¹³ is phenyl which is unsubstituted or carries 1, 2, 3 or 4 substituents, where the substituents are selected from the group consisting of halogen, nitro, cyano, OH, alkyl, alkoxy, haloalkyl, haloalkoxy, COOR⁵, NR⁶R⁷ and C(O)NR⁸R⁹.

Accordingly, the present invention relates to 1-phenyl-
15 pyrrolidin-2-one-3-carboxamides of the formula I and their agriculturally useful salts.

Moreover, the present invention relates to

- the use of compounds I and/or their salts as herbicides;
- 20 - crop protection compositions comprising at least one 1-phenylpyrrolidin-2-one-3-carboxamide of the formula I and/or at least one agriculturally useful salt of I as active substances; and
- methods for controlling unwanted vegetation, which comprises
25 allowing a herbicidally effective amount of at least one 1-phenylpyrrolidin-2-one-3-carboxamide of the formula I or an agriculturally useful salt of I to act on plants, their habitat or on seed.

30 Depending on the substitution pattern, the compounds of the formula I may contain one or more centers of chirality, in which case they are present as mixtures of enantiomers or diastereomers. The invention provides both the pure enantiomers or diastereomers and their mixtures. The invention also provides
35 tautomers of compounds of the formula I.

If R¹ represents hydrogen, the 1-phenylpyrrolidin-2-one-3-carboxamides of the formula I according to the invention can be present in the form of their agriculturally useful salts. In general,
40 agriculturally useful salts are the salts of those bases or cations which have no adverse effect on the herbicidal action of the compounds I. Thus, suitable basic salts are in particular the salts of the alkali metals, preferably of sodium and potassium, of the alkaline earth metals, preferably of calcium, magnesium
45 and barium, and of the transition metals, preferably of manganese, copper, zinc and iron, and also ammonium salts where the ammonium ion may, if desired, carry one to four C₁-C₄-alkyl

5

- substituents, C₁-C₄-hydroxyalkyl substituents, C₁-C₄-alkoxy-C₁-C₄-alkyl substituents and/or one phenyl or benzyl substituent, preferably diisopropylammonium, tetramethylammonium, tetrabutylammonium, trimethylbenzylammonium, trimethyl-
- 5 2-hydroxyethylammonium, bis(2-hydroxyethyl)methylammonium, tris(2-hydroxyethyl)ammonium, bis(2-hydroxyethyl)-dimethylammonium, tris(2-hydroxyethyl)methylammonium, furthermore phosphonium ions, sulfonium ions, preferably tri(C₁-C₄-alkyl)sulfonium, and sulfoxonium ions, preferably
- 10 tri(C₁-C₄-alkyl)sulfoxonium.

- The organic moieties mentioned in the definition of the substituents R¹ to R¹² or as radicals on heterocyclic rings are - like the term halo - collective terms for individual listings of
- 15 the individual group members. All carbon chains, i.e. all alkyl, haloalkyl, cyanoalkyl, aminoalkyl, aminocarbonylalkyl, alkoxy, haloalkoxy, alkylthio, haloalkylthio, alkylsulfinyl, alkylsulfonyl, alkynyl and alkenyl moieties, may be straight-chain or branched. Halogenated substituents preferably
- 20 carry one to five identical or different halogen atoms. The term halo denotes in each case fluorine, chlorine, bromine or iodine.

Examples of other meanings are:

- 25 - C₁-C₄-alkyl: for example methyl, ethyl, propyl, 1-methylethyl, butyl, 1-methylpropyl, 2-methylpropyl or 1,1-dimethylethyl;
- C₁-C₆-alkyl: C₁-C₄-alkyl as mentioned above and also, for example, n-pentyl, 1-methylbutyl, 2-methylbutyl,
- 30 3-methylbutyl, 2,2-dimethylpropyl, 1-ethylpropyl, hexyl, 1,1-dimethylpropyl, 1,2-dimethylpropyl, 1-methylpentyl, 2-methylpentyl, 3-methylpentyl, 4-methylpentyl, 1,1-dimethylbutyl, 1,2-dimethylbutyl, 1,3-dimethylbutyl, 2,2-dimethylbutyl, 2,3-dimethylbutyl, 3,3-dimethylbutyl,
- 35 1-ethylbutyl, 2-ethylbutyl, 1,1,2-trimethylpropyl, 1-ethyl-1-methylpropyl or 1-ethyl-3-methylpropyl;
- C₁-C₁₀-alkyl: C₁-C₆-alkyl as mentioned above and also, for example, n-heptyl, 2-heptyl, 2-methylhexyl, n-octyl,
- 40 1-methylheptyl, 2-ethylhexyl, n-nonyl, 2-nonyl, n-decyl, 2-decyl, 2-propylheptyl and the like;
- C₁-C₄-haloalkyl: a C₁-C₄-alkyl radical as mentioned above which is partially or fully substituted by fluorine,
- 45 chlorine, bromine and/or iodine, i.e., for example, chloromethyl, dichloromethyl, trichloromethyl, fluoromethyl, difluoromethyl, trifluoromethyl, chlorofluoromethyl,

- dichlorofluoromethyl, chlorodifluoromethyl, 2-fluoroethyl, 2-chloroethyl, 2-bromoethyl, 2-iodoethyl, 2,2-difluoroethyl, 2,2,2-trifluoroethyl, 2-chloro-2-fluoroethyl, 2-chloro-2,2-difluoroethyl, 2,2-dichloro-2-fluoroethyl, 2,2,2-trichloroethyl, pentafluoroethyl, 2-fluoropropyl, 3-fluoropropyl, 2,2-difluoropropyl, 2,3-difluoropropyl, 2-chloropropyl, 3-chloropropyl, 2,3-dichloropropyl, 2-bromopropyl, 3-bromopropyl, 3,3,3-trifluoropropyl, 3,3,3-trichloropropyl, 2,2,3,3,3-pentafluoropropyl, heptafluoropropyl, 1-(fluoromethyl)-2-fluoroethyl, 1-(chloromethyl)-2-chloroethyl, 1-(bromomethyl)-2-bromoethyl, 4-fluorobutyl, 4-chlorobutyl, 4-bromobutyl or nonafluorobutyl; in particular difluoromethyl, trifluoromethyl;
- 15
- C₁-C₆-haloalkyl: C₁-C₄-haloalkyl as mentioned above and also 5-fluoropentyl, 5-chloropentyl, 5-bromopentyl, 5-iodopentyl, undecafluoropentyl, 6-fluorohexyl, 6-chlorohexyl, 6-bromohexyl, 6-iodohexyl or dodecafluorohexyl;
- 20
- C₁-C₂-fluoroalkyl: C₁-C₂-alkyl which carries 1, 2, 3, 4 or 5 fluorine atoms, for example difluoromethyl, trifluoromethyl, 2-fluoroethyl, 2,2-difluoroethyl, 2,2,2-trifluoroethyl, 1,1,2,2-tetrafluoroethyl and pentafluoroethyl;
- 25
- C₁-C₂-fluoroalkoxy: C₁-C₂-alkoxy which carries 1, 2, 3, 4 or 5 fluorine atoms, for example difluoromethoxy, trifluoromethoxy, 2-fluoroethoxy, 2,2-difluoroethoxy, 2,2,2-trifluoroethoxy, 1,1,2,2-tetrafluoroethoxy and pentafluoroethoxy;
- 30
- C₁-C₄-alkoxy: for example methoxy, ethoxy, n-propoxy, 1-methylethoxy, butoxy, 1-methylpropoxy, 2-methylpropoxy or 1,1-dimethylethoxy;
- 35
- C₁-C₆-alkoxy: C₁-C₄-alkoxy as mentioned above and also, for example, pentoxy, 1-methylbutoxy, 2-methylbutoxy, 3-methylbutoxy, 1,1-dimethylpropoxy, 1,2-dimethylpropoxy, 2,2-dimethylpropoxy, 1-ethylpropoxy, hexoxy, 1-methylpentoxy, 2-methylpentoxy, 3-methylpentoxy, 4-methylpentoxy, 1,1-dimethylbutoxy, 1,2-dimethylbutoxy, 1,3-dimethylbutoxy, 2,2-dimethylbutoxy, 2,3-dimethylbutoxy, 3,3-dimethylbutoxy, 1-ethylbutoxy, 2-ethylbutoxy, 1,1,2-trimethylpropoxy, 1,2,2-trimethylpropoxy, 1-ethyl-1-methylpropoxy or
- 40
- 1-ethyl-2-methylpropoxy;
- 45

- C₁-C₄-haloalkoxy: a C₁-C₄-alkoxy radical as mentioned above which is partially or fully substituted by fluorine, chlorine, bromine and/or iodine, i.e., for example, OCH₂F, OCHF₂, OCF₃, OCH₂Cl, OCH(Cl)₂, OC(Cl)₃, chlorofluoromethoxy, dichlorofluoromethoxy, chlorodifluoromethoxy, 2-fluoroethoxy, 2-chloroethoxy, 2-bromoethoxy, 2-iodoethoxy, 2,2-difluoroethoxy, 2,2,2-trifluoroethoxy, 2-chloro-2-fluoroethoxy, 2-chloro-2,2-difluoroethoxy, 2,2-dichloro-2-fluoroethoxy, 2,2,2-trichloroethoxy, OC₂F₅, 2-fluoropropoxy, 3-fluoropropoxy, 2,2-difluoropropoxy, 2,3-difluoropropoxy, 2-chloropropoxy, 3-chloropropoxy, 2,3-dichloropropoxy, 2-bromopropoxy, 3-bromopropoxy, 3,3,3-trifluoropropoxy, 3,3,3-trichloropropoxy, OCH₂-C₂F₅, OCF₂-C₂F₅, 1-(CH₂F)-2-fluoroethoxy, 1-(CH₂Cl)-2-chloroethoxy, 1-(CH₂Br)-2-bromoethoxy, 4-fluorobutoxy, 4-chlorobutoxy, 4-bromobutoxy or nonafluorobutoxy, preferably OCHF₂ or OCHF₃;

- C₁-C₄-alkoxy-C₁-C₆-alkyl: C₁-C₆-alkyl which is substituted by C₁-C₆-alkoxy - as mentioned above -, i.e., for example, CH₂-OCH₃, CH₂-OC₂H₅, n-propoxymethyl, CH₂-OCH(CH₃)₂, n-butoxymethyl, (1-methylpropoxy)methyl, (2-methylpropoxy)methyl, CH₂-OC(CH₃)₃, 2-(methoxy)ethyl, 2-(ethoxy)ethyl, 2-(n-propoxy)ethyl, 2-(1-methylethoxy)ethyl, 2-(n-butoxy)ethyl, 2-(1-methylpropoxy)ethyl, 2-(2-methylpropoxy)ethyl, 2-(1,1-dimethylethoxy)ethyl, 2-(methoxy)propyl, 2-(ethoxy)propyl, 2-(n-propoxy)propyl, 2-(1-methylethoxy)propyl, 2-(n-butoxy)propyl, 2-(1-methylpropoxy)propyl, 2-(2-methylpropoxy)propyl, 2-(1,1-dimethylethoxy)propyl, 3-(methoxy)propyl, 3-(ethoxy)propyl, 3-(n-propoxy)propyl, 3-(1-methylethoxy)propyl, 3-(n-butoxy)propyl, 3-(1-methylpropoxy)propyl, 3-(2-methylpropoxy)propyl, 3-(1,1-dimethylethoxy)propyl, 2-(methoxy)butyl, 2-(ethoxy)butyl, 2-(n-propoxy)butyl, 2-(1-methylethoxy)butyl, 2-(n-butoxy)butyl, 2-(1-methylpropoxy)butyl, 2-(2-methylpropoxy)butyl, 2-(1,1-dimethylethoxy)butyl, 3-(methoxy)butyl, 3-(ethoxy)butyl, 3-(n-propoxy)butyl, 3-(1-methylethoxy)butyl, 3-(n-butoxy)butyl, 3-(1-methylpropoxy)butyl, 3-(2-methylpropoxy)butyl, 3-(1,1-dimethylethoxy)butyl, 4-(methoxy)butyl, 4-(ethoxy)butyl, 4-(n-propoxy)butyl, 4-(1-methylethoxy)butyl, 4-(n-butoxy)butyl, 4-(1-methylpropoxy)butyl, 4-(2-methylpropoxy)butyl, 4-(1,1-dimethylethoxy)butyl, 2-(1-methylethoxy)pentyl, 2-(n-butoxy)pentyl, 2-(1-methylpropoxy)pentyl, 2-(2-methylpropoxy)pentyl, 2-(1,1-dimethylethoxy)pentyl, 3-(methoxy)pentyl, 3-(ethoxy)pentyl, 3-(n-propoxy)pentyl,

- 3-(1-methylethoxy)pentyl, 3-(n-butoxy)pentyl,
 3-(1-methylpropoxy)pentyl, 3-(2-methylpropoxy)pentyl,
 3-(1,1-dimethylethoxy)pentyl, 4-(methoxy)pentyl,
 4-(ethoxy)pentyl, 4-(n-propoxy)pentyl,
 5 4-(1-methylethoxy)pentyl, 4-(n-butoxy)pentyl,
 4-(1-methylpropoxy)pentyl, 4-(2-methylpropoxy)pentyl,
 4-(1,1-dimethylethoxy)pentyl, 4-(methoxy)pentyl,
 5-(ethoxy)pentyl, 5-(n-propoxy)pentyl,
 5-(1-methylethoxy)pentyl, 5-(n-butoxy)pentyl,
 10 5-(1-methylpropoxy)pentyl, 5-(2-methylpropoxy)pentyl,
 5-(1,1-dimethylethoxy)pentyl, 2-(1-methylethoxy)hexyl,
 2-(n-butoxy)hexyl, 2-(1-methylpropoxy)hexyl,
 2-(2-methylpropoxy)hexyl, 2-(1,1-dimethylethoxy)hexyl,
 3-(methoxy)hexyl, 3-(ethoxy)hexyl, 3-(n-propoxy)hexyl,
 15 3-(1-methylethoxy)hexyl, 3-(n-butoxy)hexyl,
 3-(1-methylpropoxy)hexyl, 3-(2-methylpropoxy)hexyl,
 3-(1,1-dimethylethoxy)hexyl, 4-(methoxy)hexyl,
 4-(ethoxy)hexyl, 4-(n-propoxy)hexyl, 4-(1-methylethoxy)hexyl,
 4-(n-butoxy)hexyl, 4-(1-methylpropoxy)hexyl,
 20 4-(2-methylpropoxy)hexyl, 4-(1,1-dimethylethoxy)hexyl,
 4-(methoxy)hexyl, 5-(ethoxy)hexyl, 5-(n-propoxy)hexyl,
 5-(1-methylethoxy)hexyl, 5-(n-butoxy)hexyl,
 5-(1-methylpropoxy)hexyl, 5-(2-methylpropoxy)hexyl,
 5-(1,1-dimethylethoxy)hexyl, 6-(ethoxy)hexyl,
 25 6-(n-propoxy)hexyl, 6-(1-methylethoxy)hexyl,
 6-(n-butoxy)hexyl, 6-(1-methylpropoxy)hexyl,
 6-(2-methylpropoxy)hexyl, 6-(1,1-dimethylethoxy)hexyl;
- C₁-C₄-alkylthio: an alkylsulfanyl radical having 1 to 4 carbon
 30 atoms, for example SCH₃, SC₂H₅, SCH₂-C₂H₅, SCH(CH₃)₂,
 n-butylthio, SCH(CH₃)-C₂H₅, SCH₂-CH(CH₃)₂ or SC(CH₃)₃;
- C₁-C₆-alkylthio: C₁-C₄-alkylthio as mentioned above and also,
 for example, pentylthio, 1-methylbutylthio,
 35 2-methylbutylthio, 3-methylbutylthio, 2,2-dimethylpropylthio,
 1-ethylpropylthio, hexylthio, 1,1-dimethylpropylthio,
 1,2-dimethylpropylthio, 1-methylpentylthio,
 2-methylpentylthio, 3-methylpentylthio, 4-methylpentylthio,
 1,1-dimethylbutylthio, 1,2-dimethylbutylthio,
 40 1,3-dimethylbutylthio, 2,2-dimethylbutylthio,
 2,3-dimethylbutylthio, 3,3-dimethylbutylthio,
 1-ethylbutylthio, 2-ethylbutylthio,
 1,1,2-trimethylpropylthio, 1,2,2-trimethylpropylthio,
 1-ethyl-1-methylpropylthio or 1-ethyl-2-methylpropylthio;
 45
- C₁-C₄-haloalkylthio: a C₁-C₄-alkylthio radical as mentioned
 above which is partially or fully substituted by fluorine,

- chlorine, bromine and/or iodine, i.e., for example, fluoromethylthio, difluoromethylthio, trifluoromethylthio, chlorodifluoromethylthio, bromodifluoromethylthio, 2-fluoroethylthio, 2-chloroethylthio, 2-bromoethylthio, 2-iodoethylthio, 2,2-difluoroethylthio, 2,2,2-trifluoroethylthio, 2,2,2-trichloroethylthio, 2-chloro-2-fluoroethylthio, 2-chloro-2,2-difluoroethylthio, 2,2-dichloro-2-fluoroethylthio, pentafluoroethylthio, 2-fluoropropylthio, 3-fluoropropylthio, 2-chloropropylthio, 3-chloropropylthio, 2-bromopropylthio, 3-bromopropylthio, 2,2-difluoropropylthio, 2,3-difluoropropylthio, 2,3-dichloropropylthio, 3,3,3-trifluoropropylthio, 3,3,3-trichloropropylthio, 2,2,3,3,3-pentafluoropropylthio, heptafluoropropylthio, 1-(fluoromethyl)-2-fluoroethylthio, 1-(chloromethyl)-2-chloroethylthio, 1-(bromomethyl)-2-bromoethylthio, 4-fluorobutylthio, 4-chlorobutylthio, 4-bromobutylthio or nonafluorobutylthio;
- phenyl-C₁-C₄-alkyl: for example benzyl, 1-phenylethyl, 2-phenylethyl, 1-phenylprop-1-yl, 2-phenylprop-1-yl, 3-phenylprop-1-yl, 1-phenylbut-1-yl, 2-phenylbut-1-yl, 3-phenylbut-1-yl, 4-phenylbut-1-yl, 1-phenylbut-2-yl, 2-phenylbut-2-yl, 3-phenylbut-2-yl, 4-phenylbut-2-yl, 1-(benzyl)eth-1-yl, 1-(benzyl)-1-(methyl)eth-1-yl or 1-(benzyl)prop-1-yl;
- C₂-C₆-alkenyl: a monounsaturated aliphatic hydrocarbon radical having 2 to 6 and in particular 2 to 4 carbon atoms, for example ethenyl, prop-1-en-1-yl, prop-2-en-1-yl, 1-methylethenyl, buten-1-yl, buten-2-yl, buten-3-yl, 1-methylprop-1-en-1-yl, 2-methylprop-1-en-1-yl, 1-methylprop-2-en-1-yl, 2-methylprop-2-en-1-yl, penten-1-yl, penten-2-yl, penten-3-yl, penten-4-yl, 1-methylbut-1-en-1-yl, 2-methylbut-1-en-1-yl, 3-methylbut-1-en-1-yl, 1-methylbut-2-en-1-yl, 2-methylbut-2-en-1-yl, 3-methylbut-2-en-1-yl, 1-methylbut-3-en-1-yl, 2-methylbut-3-en-1-yl, 3-methylbut-3-en-1-yl, 1,1-dimethylprop-2-en-1-yl, 1,2-dimethylprop-1-en-1-yl, 1,2-dimethylprop-2-en-1-yl, 1-ethylprop-1-en-2-yl, 1-ethylprop-2-en-1-yl, hex-1-en-1-yl, hex-2-en-1-yl, hex-3-en-1-yl, hex-4-en-1-yl, hex-5-en-1-yl, 1-methylpent-1-en-1-yl, 2-methylpent-1-en-1-yl, 3-methylpent-1-en-1-yl, 4-methylpent-1-en-1-yl, 1-methylpent-2-en-1-yl, 2-methylpent-2-en-1-yl, 3-methylpent-2-en-1-yl, 4-methylpent-2-en-1-yl, 1-methylpent-3-en-1-yl, 2-methylpent-3-en-1-yl, 3-methylpent-3-en-1-yl, 4-methylpent-3-en-1-yl,

10

- 1-methylpent-4-en-1-yl, 2-methylpent-4-en-1-yl,
 3-methylpent-4-en-1-yl, 4-methylpent-4-en-1-yl,
 1,1-dimethylbut-2-en-1-yl, 1,1-dimethylbut-3-en-1-yl,
 1,2-dimethylbut-1-en-1-yl, 1,2-dimethylbut-2-en-1-yl,
 5 1,2-dimethylbut-3-en-1-yl, 1,3-dimethylbut-1-en-1-yl,
 1,3-dimethylbut-2-en-1-yl, 1,3-dimethylbut-3-en-1-yl,
 2,2-dimethylbut-3-en-1-yl, 2,3-dimethylbut-1-en-1-yl,
 2,3-dimethylbut-2-en-1-yl, 2,3-dimethylbut-3-en-1-yl,
 3,3-dimethylbut-1-en-1-yl, 3,3-dimethylbut-2-en-1-yl,
 10 1-ethylbut-1-en-1-yl, 1-ethylbut-2-en-1-yl,
 1-ethylbut-3-en-1-yl, 2-ethylbut-1-en-1-yl,
 2-ethylbut-2-en-1-yl, 2-ethylbut-3-en-1-yl,
 1,1,2-trimethylprop-2-en-1-yl,
 1-ethyl-1-methylprop-2-en-1-yl,
 15 1-ethyl-2-methylprop-1-en-1-yl and
 1-ethyl-2-methylprop-2-en-1-yl;
- C₃-C₈-alkenyl: an aliphatic hydrocarbon radical which contains
 a C=C double bond and has 3 to 8, preferably 3 to 6 and in
 20 particular 3 or 4 carbon atoms as mentioned above, which is
 preferably not attached via a carbon atom of the double bond,
 for example one of the radicals mentioned under C₂-C₆-alkenyl
 and also 1-hepten-3-yl, 1-hepten-4-yl, 1-hepten-5-yl,
 1-hepten-6-yl, 1-hepten-7-yl, 3-hepten-1-yl, 2-hepten-4-yl,
 25 3-hepten-5-yl, 3-hepten-6-yl, 3-hepten-7-yl, 1-octen-3-yl,
 1-octen-4-yl, 1-octen-5-yl, 1-octen-6-yl, 1-octen-7-yl,
 1-octen-8-yl, 3-octen-1-yl, 2-octen-1-yl, 2-octen-4-yl,
 3-octen-5-yl, 3-octen-6-yl, 3-octen-7-yl, 3-octen-8-yl and
 the like;
 30
- C₂-C₆-haloalkenyl: C₂-C₆-alkenyl as mentioned above which is
 partially or fully substituted by fluorine, chlorine, and/or
 bromine, i.e., for example, 2-chlorovinyl, 2-chloroallyl,
 3-chloroallyl, 2,3-dichloroallyl, 3,3-dichloroallyl,
 35 2,3,3-trichloroallyl, 2,3-dichlorobut-2-enyl, 2-bromoallyl,
 3-bromoallyl, 2,3-dibromoallyl, 3,3-dibromoallyl,
 2,3,3-tribromoallyl and 2,3-dibromobut-2-enyl;
- C₂-C₆-alkynyl: an aliphatic hydrocarbon radical which contains
 a C-C triple bond and has 2 to 6 and in particular 2 to 4
 40 carbon atoms: for example ethynyl, propargyl (2-propynyl),
 1-propynyl, but-1-yn-3-yl, but-1-yn-4-yl, but-2-yn-1-yl,
 pent-1-yn-3-yl, pent-1-yn-4-yl, pent-1-yn-5-yl,
 pent-2-yn-1-yl, pent-2-yn-4-yl, pent-2-yn-5-yl,
 45 3-methylbut-1-yn-3-yl, 3-methylbut-1-yn-4-yl, hex-1-yn-3-yl,
 hex-1-yn-4-yl, hex-1-yn-5-yl, hex-1-yn-6-yl, hex-2-yn-1-yl,
 hex-2-yn-4-yl, hex-2-yn-5-yl, hex-2-yn-6-yl, hex-3-yn-1-yl,

hex-3-yn-2-yl, 3-methylpent-1-yn-3-yl,
 3-methylpent-1-yn-4-yl, 3-methylpent-1-yn-5-yl,
 4-methylpent-2-yn-4-yl or 4-methylpent-2-yn-5-yl;

- 5 - C₃-C₁₀-alkynyl: an aliphatic hydrocarbon radical which contains a triple bond and has 3 to 10, preferably 3 to 6 and in particular 3 or 4 carbon atoms as mentioned above, which is preferably not attached via a carbon atom of the triple bond, for example one of the radicals mentioned under
- 10 C₂-C₆-alkynyl and also 1-heptyn-3-yl, 1-heptyn-4-yl, 1-heptyn-5-yl, 1-heptyn-6-yl, 1-heptyn-7-yl, 3-heptyn-1-yl, 2-heptyn-4-yl, 3-heptyn-5-yl, 3-heptyn-6-yl, 3-heptyn-7-yl, 1-octyn-3-yl, 1-octyn-4-yl, 1-octyn-5-yl, 1-octyn-6-yl, 1-octyn-7-yl, 1-octyn-8-yl, 3-octyn-1-yl, 2-octyn-1-yl,
- 15 2-octyn-4-yl, 3-octyn-5-yl, 3-octyn-6-yl, 3-octyn-7-yl, 3-octyn-8-yl and the like;
- C₃-C₁₀-cycloalkyl: a monocyclic hydrocarbon radical having 3 to 10 carbon atoms, in particular 3 to 8 carbon atoms and especially 3 to 6 carbon atoms, for example cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, cycloheptyl or cyclooctyl;
- 20 - C₇-C₁₀-polycycloalkyl: a bicyclic, tricyclic or tetracyclic hydrocarbon radical having 7 to 10 carbon atoms, for example bicyclo[2.2.1]-hept-1-yl, bicyclo[2.2.1]hept-2-yl, bicyclo[2.2.1]hept-7-yl, bicyclo[2.2.2]oct-1-yl, bicyclo[2.2.2]oct-2-yl or adamantan-1-yl;
- 25 - C₃-C₈-cycloalkyl-C₁-C₄-alkyl: C₁-C₄-alkyl which carries a C₃-C₈-cycloalkyl radical as defined above, for example cyclopropylmethyl, 1-cyclopropylethyl, 2-cyclopropylethyl, 1-cyclopropylprop-1-yl, 2-cyclopropylprop-1-yl, 3-cyclopropylprop-1-yl, 1-cyclopropylbut-1-yl,
- 30 2-cyclopropylbut-1-yl, 3-cyclopropylbut-1-yl, 4-cyclopropylbut-1-yl, 1-cyclopropylbut-2-yl, 2-cyclopropylbut-2-yl, 3-cyclopropylbut-2-yl, 3-cyclopropylbut-2-yl, 4-cyclopropylbut-2-yl, 1-(cyclopropylmethyl)eth-1-yl,
- 35 1-(cyclopropylmethyl)-1-(methyl)eth-1-yl, 1-(cyclopropylmethyl)prop-1-yl, cyclobutylmethyl, 1-cyclobutylethyl, 2-cyclobutylethyl, 1-cyclobutylprop-1-yl, 2-cyclobutylprop-1-yl, 3-cyclobutylprop-1-yl,
- 40 1-cyclobutylbut-1-yl, 2-cyclobutylbut-1-yl, 3-cyclobutylbut-1-yl, 4-cyclobutylbut-1-yl, 1-cyclobutylbut-2-yl, 2-cyclobutylbut-2-yl,
- 45 3-cyclobutylbut-2-yl, 4-cyclobutylbut-2-yl,

12

- 1-(cyclobutylmethyl)eth-1-yl,
 1-(cyclobutylmethyl)-1-(methyl)eth-1-yl,
 1-(cyclobutylmethyl)prop-1-yl, cyclopentylmethyl,
 1-cyclopentylethyl, 2-cyclopentylethyl,
 5 1-cyclopentylprop-1-yl, 2-cyclopentylprop-1-yl,
 3-cyclopentylprop-1-yl, 1-cyclopentylbut-1-yl,
 2-cyclopentylbut-1-yl, 3-cyclopentylbut-1-yl,
 4-cyclopentylbut-1-yl, 1-cyclopentylbut-2-yl,
 2-cyclopentylbut-2-yl, 3-cyclopentylbut-2-yl,
 10 3-cyclopentylbut-2-yl, 4-cyclopentylbut-2-yl,
 1-(cyclopentylmethyl)eth-1-yl,
 1-(cyclopentylmethyl)-1-(methyl)eth-1-yl,
 1-(cyclopentylmethyl)prop-1-yl, cyclohexylmethyl,
 1-cyclohexylethyl, 2-cyclohexylethyl, 1-cyclohexylprop-1-yl,
 15 2-cyclohexylprop-1-yl, 3-cyclohexylprop-1-yl,
 1-cyclohexylbut-1-yl, 2-cyclohexylbut-1-yl,
 3-cyclohexylbut-1-yl, 4-cyclohexylbut-1-yl,
 1-cyclohexylbut-2-yl, 2-cyclohexylbut-2-yl,
 3-cyclohexylbut-2-yl, 4-cyclohexylbut-2-yl,
 20 1-(cyclohexylmethyl)eth-1-yl,
 1-(cyclohexylmethyl)-1-(methyl)eth-1-yl,
 1-(cyclohexylmethyl)prop-1-yl, cycloheptylmethyl,
 1-cycloheptylethyl, 2-cycloheptylethyl,
 1-cycloheptylprop-1-yl, 2-cycloheptylprop-1-yl,
 25 3-cycloheptylprop-1-yl, 1-cycloheptylbut-1-yl,
 2-cycloheptylbut-1-yl, 3-cycloheptylbut-1-yl,
 4-cycloheptylbut-1-yl, 1-cycloheptylbut-2-yl,
 2-cycloheptylbut-2-yl, 3-cycloheptylbut-2-yl,
 4-cycloheptylbut-2-yl, 1-(cycloheptylmethyl)eth-1-yl,
 30 1-(cycloheptylmethyl)-1-(methyl)eth-1-yl,
 1-(cycloheptylmethyl)prop-1-yl, cyclooctylmethyl,
 1-cyclooctylethyl, 2-cyclooctylethyl, 1-cyclooctylprop-1-yl,
 2-cyclooctylprop-1-yl, 3-cyclooctylprop-1-yl,
 1-cyclooctylbut-1-yl, 2-cyclooctylbut-1-yl,
 35 3-cyclooctylbut-1-yl, 4-cyclooctylbut-1-yl,
 1-cyclooctylbut-2-yl, 2-cyclooctylbut-2-yl,
 3-cyclooctylbut-2-yl, 4-cyclooctylbut-2-yl,
 1-(cyclooctylmethyl)eth-1-yl,
 1-(cyclooctylmethyl)-1-(methyl)eth-1-yl or
 40 1-(cyclooctylmethyl)prop-1-yl, preferably cyclopropylmethyl,
 cyclobutylmethyl, cyclopentylmethyl or cyclohexylmethyl.
- C₅–C₁₀–cycloalkenyl: a mono- or bicyclic hydrocarbon radical
 having 5 to 10 carbon atoms, in particular 5 to 8 carbon
 45 atoms and especially 5 to 6 carbon atoms and which contains a
 C=C double bond, for example cyclopenten-1-yl,
 cyclopenten-3-yl, cyclohexen-1-yl, cyclohexen-3-yl,

- cyclohexen-4-yl, cyclohepten-1-yl, cyclohepten-3-yl,
cyclohepten-4-yl, cycloocten-1-yl, cycloocten-3-yl,
cycloocten-4-yl, cycloocten-5-yl,
bicyclo[2.2.1]hept-2-en-1-yl, bicyclo[2.2.1]hept-2-en-2-yl,
5 bicyclo[2.2.1]hept-2-en-5-yl, bicyclo[2.2.1]hept-2-en-7-yl,
bicyclo[2.2.2]oct-2-en-1-yl, bicyclo[2.2.2]oct-2-en-2-yl,
bicyclo[2.2.2]oct-2-en-5-yl, bicyclo[2.2.2]oct-2-en-7-yl;
- unsubstituted or substituted phenyl: a phenyl group which is
10 unsubstituted or carries 1, 2, 3 or 4 substituents, where the
substituents are selected from the group consisting of
halogen, nitro, cyano, OH, alkyl, alkoxy, haloalkyl,
haloalkoxy, COOR⁵, NR⁶R⁷, C(O)NR⁸R⁹;
- 15 - 3- to 7-membered heterocyclyl: a heterocyclic radical which
has 3, 4, 5, 6 or 7 ring members, where 1, 2 or 3 of the ring
members are heteroatoms selected from the group consisting of
oxygen, nitrogen, sulfur, a group SO₂ and a group NR¹⁰.
Moreover, the heterocycle may optionally contain 1, 2 or 3
20 carbonyl groups and/or thiocarbonyl groups as ring members.
The heterocycle may furthermore contain a ring-fused
unsubstituted or substituted phenyl ring. The heterocycle may
be aromatic (heteroaryl) or partially or fully saturated.
- 25 Examples of saturated heterocycles are:
oxiran-1-yl, aziridin-1-yl, oxetan-2-yl, oxetan-3-yl,
thietan-2-yl, thietan-3-yl, azetidin-1-yl, azetidin-2-yl,
azetidin-3-yl, tetrahydrofuran-2-yl, tetrahydrofuran-3-yl,
tetrahydrothiophen-2-yl, tetrahydrothiophen-3-yl,
30 pyrrolidin-1-yl, pyrrolidin-2-yl, pyrrolidin-3-yl,
1,3-dioxolan-2-yl, 1,3-dioxolan-4-yl, 1,3-oxathiolan-2-yl,
1,3-oxathiolan-4-yl, 1,3-oxathiolan-5-yl,
1,3-oxazolidin-2-yl, 1,3-oxazolidin-3-yl,
1,3-oxazolidin-4-yl, 1,3-oxazolidin-5-yl,
35 1,2-oxazolidin-2-yl, 1,2-oxazolidin-3-yl,
1,2-oxazolidin-4-yl, 1,2-oxazolidin-5-yl, 1,3-dithiolan-2-yl,
1,3-dithiolan-4-yl, pyrrolidin-1-yl, pyrrolidin-2-yl,
pyrrolidin-5-yl, tetrahydropyrazol-1-yl,
tetrahydropyrazol-3-yl, tetrahydropyrazol-4-yl,
40 tetrahydropyran-2-yl, tetrahydropyran-3-yl,
tetrahydropyran-4-yl, tetrahydrothiopyran-2-yl,
tetrahydrothiopyran-3-yl, tetrahydropyran-4-yl,
piperidin-1-yl, piperidin-2-yl, piperidin-3-yl,
piperidin-4-yl, 1,3-dioxan-2-yl, 1,3-dioxan-4-yl,
45 1,3-dioxan-5-yl, 1,4-dioxan-2-yl, 1,3-oxathian-2-yl,
1,3-oxathian-4-yl, 1,3-oxathian-5-yl, 1,3-oxathian-6-yl,
1,4-oxathian-2-yl, 1,4-oxathian-3-yl, morpholin-2-yl,

14 .

morpholin-3-yl, morpholin-4-yl, hexahydropyridazin-1-yl,
 hexahydropyridazin-3-yl, hexahydropyridazin-4-yl,
 hexahydropyrimidin-1-yl, hexahydropyrimidin-2-yl,
 hexahydropyrimidin-4-yl, hexahydropyrimidin-5-yl,
 5 piperazin-1-yl, piperazin-2-yl, piperazin-3-yl,
 hexahydro-1,3,5-triazin-1-yl, hexahydro-1,3,5-triazin-2-yl,
 oxepan-2-yl, oxepan-3-yl, oxepan-4-yl, thiepan-2-yl,
 thiepan-3-yl, thiepan-4-yl, 1,3-dioxepan-2-yl,
 1,3-dioxepan-4-yl, 1,3-dioxepan-5-yl, 1,3-dioxepan-6-yl,
 10 1,3-dithiepan-2-yl, 1,3-dithiepan-4-yl, 1,3-dithiepan-5-yl,
 1,3-dithiepan-6-yl, 1,4-dioxepan-2-yl, 1,4-dioxepan-7-yl,
 hexahydroazepin-1-yl, hexahydroazepin-2-yl,
 hexahydroazepin-3-yl, hexahydroazepin-4-yl,
 hexahydro-1,3-diazepin-1-yl, hexahydro-1,3-diazepin-2-yl,
 15 hexahydro-1,3-diazepin-4-yl, hexahydro-1,4-diazepin-1-yl and
 hexahydro-1,4-diazepin-2-yl;

Examples of unsaturated heterocycles are:

dihydrofuran-2-yl, 1,2-oxazolin-3-yl, 1,2-oxazolin-5-yl,
 20 1,3-oxazolin-2-yl;

Examples of aromatic heterocyclyl are the 5- and 6-membered
 aromatic, heterocyclic radicals, for example furyl, such as
 2-furyl and 3-furyl, thienyl, such as 2-thienyl and
 25 3-thienyl, pyrrolyl, such as 2-pyrrolyl and 3-pyrrolyl,
 isoxazolyl, such as 3-isoxazolyl, 4-isoxazolyl and
 5-isoxazolyl, isothiazolyl, such as 3-isothiazolyl,
 4-isothiazolyl and 5-isothiazolyl, pyrazolyl, such as
 3-pyrazolyl, 4-pyrazolyl and 5-pyrazolyl, oxazolyl, such as
 30 2-oxazolyl, 4-oxazolyl and 5-oxazolyl, thiazolyl, such as
 2-thiazolyl, 4-thiazolyl and 5-thiazolyl, imidazolyl, such as
 2-imidazolyl and 4-imidazolyl, oxadiazolyl, such as
 1,2,4-oxadiazol-3-yl, 1,2,4-oxadiazol-5-yl and
 1,3,4-oxadiazol-2-yl, thiadiazolyl, such as
 35 1,2,4-thiadiazol-3-yl, 1,2,4-thiadiazol-5-yl and
 1,3,4-thiadiazol-2-yl, triazolyl, such as 1,2,4-triazol-1-yl,
 1,2,4-triazol-3-yl and 1,2,4-triazol-4-yl, pyridinyl, such as
 2-pyridinyl, 3-pyridinyl and 4-pyridinyl, pyridazinyl, such
 as 3-pyridazinyl and 4-pyridazinyl, pyrimidinyl, such as
 40 2-pyrimidinyl, 4-pyrimidinyl and 5-pyrimidinyl, furthermore
 2-pyrazinyl, 1,3,5-triazin-2-yl and 1,2,4-triazin-3-yl, in
 particular pyridyl, pyrimidyl, furanyl and thienyl.

If the radicals R^2 and R^3 together with the nitrogen atom to which
 45 they are attached form a saturated heterocycle, n is preferably
 0. In this case, the saturated heterocycle is selected, for
 example, from the group consisting of 1,3-oxazolidin-3-yl,

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1,2-oxazolidin-2-yl, pyrrolidin-1-yl, pyrrolidin-2-on-1-yl, tetrahydropyrazol-1-yl, 2-methyltetrahydropyrazol-1-yl, piperidin-1-yl, piperidin-2-on-1-yl, morpholin-4-yl, hexahydropyrimidin-1-yl, piperazin-1-yl, 4-methylpiperazin-1-yl, 5 hexahydro-1,3,5-triazin-1-yl, 3,5-dimethyltriazin-1-yl, hexahydroazepin-1-yl, hexahydroazepin-2-on-1-yl, hexahydro-1,3-diazepin-1-yl, hexahydro-1,4-diazepin-1-yl, in particular from the group consisting of pyrrolidin-1-yl, piperidin-1-yl and morpholin-4-yl.

10

If two adjacent radicals R^a to R^e together with the atoms to which they are attached form a 5-, 6- or 7-membered saturated or unsaturated ring which may contain one or two heteroatoms selected from the group consisting of nitrogen, oxygen, sulfur and a group NR^{10} as ring-forming atom(s) and/or may carry one, 15 two, three or four radicals selected from the group consisting of halogen and C_1 - C_4 -alkyl, two adjacent radicals R^a to R^e , for example R^b and R^c or R^c and R^d , together are a 3-, 4- or 5-membered saturated or unsaturated carbon chain in which one or two 20 non-adjacent carbon atoms of the chain may be replaced by heteroatoms selected from the group consisting of O, N, a group NR^{10} and S and in which the carbon atoms of the chain may carry one, two, three or four substituents selected from the group consisting of halogen and C_1 - C_4 -alkyl. For example, two adjacent 25 radicals R^a to R^e may be a chain of the formula $-O-CH_2-O-$, $-O-(CH_2)_2-O-$, $-O-(CH_2)_2-$, $-O-(CH_2)_3-$, $-(CH_2)_3-$, $-(CH_2)_4-$ or $-(CH_2)_5-$.

With a view to the use of the compounds of the formula I according to the invention as herbicides, the variables R^1 , R^2 , 30 R^3 , X, Y, A, n, R^a , R^b , R^c , R^d and R^e are preferably as defined below, independently of one another and in particular in combination:

R^1 is hydrogen, OH, Cl, Br, C_1 - C_6 -alkyl or $OC(O)R^4$, particularly 35 preferably hydrogen;

R^2 is C_1 - C_{10} -alkyl, C_3 - C_8 -cycloalkyl, C_3 - C_8 -alkenyl, C_3 - C_8 -alkynyl, C_3 - C_8 -cycloalkyl, C_5 - C_8 -cycloalkenyl or C_3 - C_8 -cycloalkyl- C_1 - C_4 -alkyl, where C_1 - C_{10} -alkyl and 40 C_3 - C_8 -cycloalkyl may be partially or fully halogenated and/or may carry one or two radicals selected from the group consisting of C_1 - C_6 -alkoxy, C_1 - C_4 -haloalkoxy, C_1 - C_6 -alkylthio, C_1 - C_4 -haloalkylthio, unsubstituted or substituted phenyl, $COOR^5$, NR^6R^7 , $C(O)NR^8R^9$, phenyl which may be unsubstituted or 45 substituted by 1, 2 or 3 substituents selected from the group consisting of halogen, nitro, OH, CN, C_1 - C_6 -alkyl, C_1 - C_6 -alkoxy, C_1 - C_4 -haloalkoxy, C_1 - C_6 -alkylthio,

- C₁-C₄-haloalkylthio, unsubstituted or substituted phenyl, COOR⁵, NR⁶R⁷, C(O)NR⁸R⁹. In particular, R² is C₁-C₆-alkyl, C₃-C₆-cycloalkyl, C₃-C₆-alkenyl, C₃-C₆-alkynyl, C₅-C₆-cycloalkenyl, C₃-C₆-cycloalkyl-C₁-C₄-alkyl or
- 5 unsubstituted or substituted phenyl, where C₁-C₆-alkyl and C₃-C₆-cycloalkyl may be partially or fully halogenated and/or may carry one or two, in particular one, radical selected from the group consisting of C₁-C₆-alkoxy, C₁-C₄-haloalkoxy, C₁-C₆-alkylthio, C₁-C₄-haloalkylthio, unsubstituted or
- 10 substituted phenyl, COOR⁵, NR⁶R⁷, C(O)NR⁸R⁹. Particularly preferably, R² is C₁-C₆-alkyl, C₃-C₈-cycloalkyl, unsubstituted or substituted phenyl, phenylalkyl or C₃-C₈-cycloalkyl-C₁-C₄-alkyl;
- 15 R³ is hydrogen or C₁-C₆-alkyl;
- X is oxygen;
- Y is oxygen; and
- 20 A if present, is oxygen, a group N-R¹², where R¹² = hydrogen or alkyl, or a group SO₂;
- n is 0;
- 25 R^a, R^b, R^c, R^d, R^e are hydrogen, halogen, CN, C₁-C₄-alkyl, C₁-C₄-haloalkyl, C₁-C₄-alkoxy, C₁-C₄-haloalkoxy, in particular halogen, CN, C₁-C₄-alkyl, C₁-C₂-fluoroalkyl and C₁-C₂-fluoroalkoxy and especially fluorine, chlorine, bromine,
- 30 CN, C₁-C₄-alkyl, methoxy, CF₃, CHF₂, OCF₃ and OCHF₂.

With a view to the use as herbicides, preference is given to 1-phenylpyrrolidin-2-one-3-carboxamides of the formula I according to the invention where not more than 3 of the radicals

35 R^a, R^b, R^c, R^d and R^e and in particular 3 or 4 of the abovementioned radicals are different from hydrogen. Particular preference is given to 1-phenylpyrrolidin-2-one-3-carboxamides of the formula I where at least R^b and/or R^d are different from hydrogen. In this case, the other radicals R^a-R^e, at least one of

40 the radicals R^a and R^e and especially both radicals R^a and R^e are particularly preferably hydrogen. Particular preference is also given to compounds of the formula I in which R^b and R^c or R^d and R^c are different from hydrogen and the other radicals of the radicals R^a-R^e are hydrogen. Another preferred embodiment of the

45 invention relates to compounds in which the radicals R^a and R^e or

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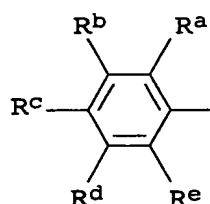
R^a and R^b or R^a and R^c are different from hydrogen and the other radicals of the radicals R^a - R^e are hydrogen.

Preferred radicals R^a , R^b , R^c , R^d , R^e are, in addition to hydrogen, the substituents halogen, CN, C_1 - C_4 -alkyl, C_1 - C_4 -haloalkyl, C_1 - C_4 -alkoxy, C_1 - C_4 -haloalkoxy, in particular halogen, CN, C_1 - C_4 -alkyl, C_1 - C_2 -fluoroalkyl and C_1 - C_2 -fluoroalkoxy and especially fluorine, chlorine, bromine, CN, C_1 - C_4 -alkyl, methoxy, CF_3 , CHF_2 , OCF_3 and $OCHF_2$.

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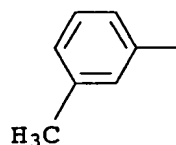
A particularly preferred group of compounds of the formula I are those compounds in which R^a and R^e are hydrogen. Here, the radical

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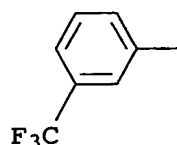


20 denotes, for example, a group of the formulae Q1 to Q31:

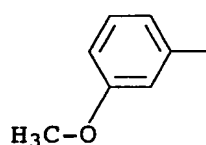
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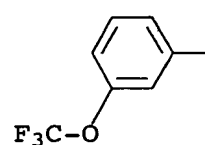
Q1



Q2

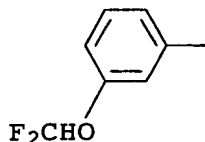


Q3

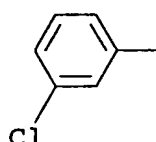


Q4

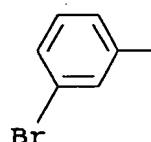
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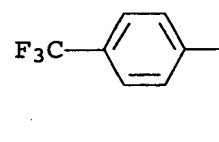
Q5



Q6

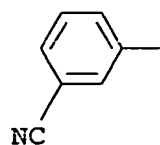


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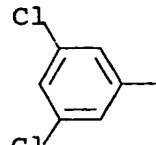


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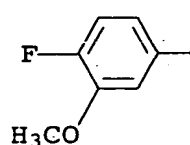
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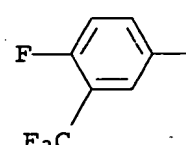
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Q10

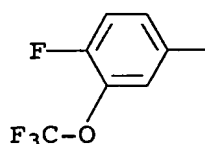


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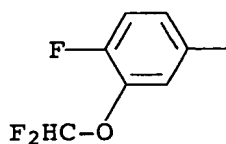


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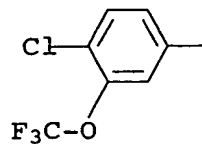
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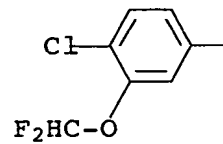
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Q14



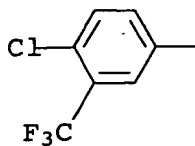
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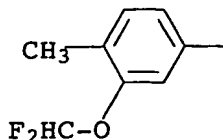
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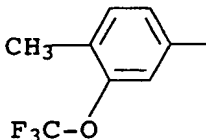
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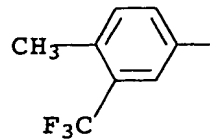
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Q18

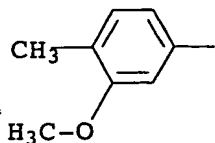


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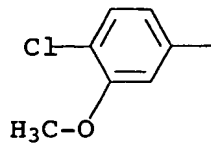


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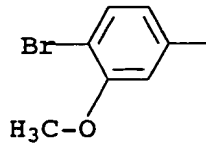
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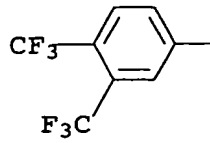
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Q22

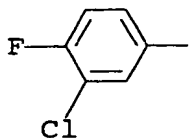


Q23

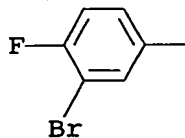


Q24

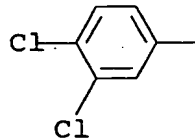
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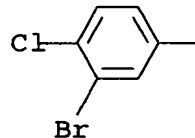
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Q26

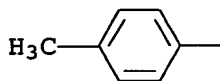


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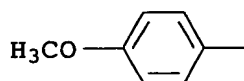


Q28

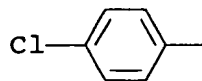
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Q29



Q30

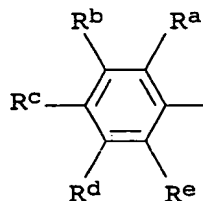


Q31

25

Another preferred group of compounds of the formula I are those compounds in which R^a and, if appropriate, one of the radicals R^b , R^c or R^e are different from hydrogen and the other radicals R^a - R^e are hydrogen. Here, the radical

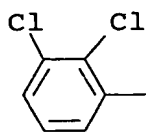
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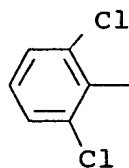
35

denotes, for example, a group of the formulae Q32 to Q39:

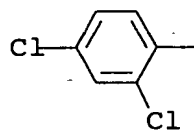
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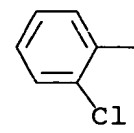
Q32



Q33

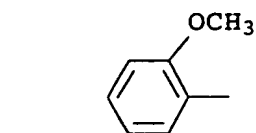


Q34

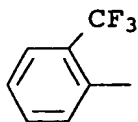


Q35

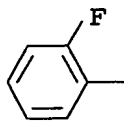
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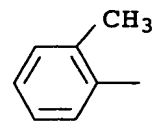
Q36



Q37

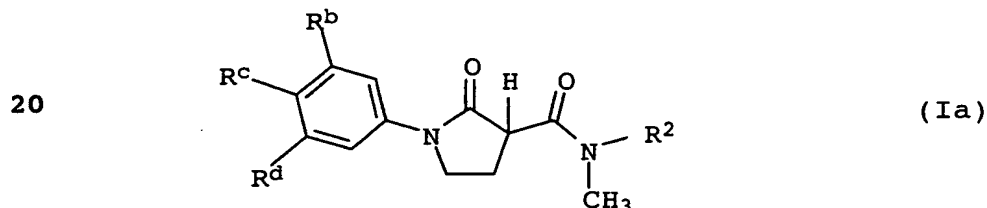


Q38



Q39

Particular preference is given to the
 1-phenylpyrrolidin-2-one-3-carboxamides of the formula Ia (= I
 10 where $R^a = R^b = H$, $X = O$, $Y = O$, $R^1 = H$, $R^3 = CH_3$ and $n = 0$) where
 R^b , R^c , R^d and R^2 have the meanings mentioned above, in particular
 the meanings mentioned as being preferred. Examples of such
 compounds are the compounds Ia.1 to Ia.1717 in which the
 variables R^b , R^c , R^d and R^2 together have the meanings given in
 15 one row of Table 1.



25 Table 1:

No.	R^b	R^c	R^d	R^2
1.	Cl	H	H	H
2.	Br	H	H	H
30 3.	F	H	H	H
4.	CH ₃	H	H	H
5.	C ₂ H ₅	H	H	H
6.	CH(CH ₃) ₂	H	H	H
7.	OCH ₃	H	H	H
8.	CN	H	H	H
35 9.	CF ₃	H	H	H
10.	OCF ₃	H	H	H
11.	OCHF ₂	H	H	H
12.	Cl	H	H	CH ₃
13.	Br	H	H	CH ₃
40 14.	F	H	H	CH ₃
15.	CH ₃	H	H	CH ₃
16.	C ₂ H ₅	H	H	CH ₃
17.	CH(CH ₃) ₂	H	H	CH ₃
18.	OCH ₃	H	H	CH ₃
19.	CN	H	H	CH ₃
45 20.	CF ₃	H	H	CH ₃
21.	OCF ₃	H	H	CH ₃
22.	OCHF ₂	H	H	CH ₃

No.	R ^b	R ^c	R ^d	R ²
23.	Cl	H	H	C ₂ H ₅
24.	Br	H	H	C ₂ H ₅
25.	F	H	H	C ₂ H ₅
5 26.	CH ₃	H	H	C ₂ H ₅
27.	C ₂ H ₅	H	H	C ₂ H ₅
28.	CH(CH ₃) ₂	H	H	C ₂ H ₅
29.	OCH ₃	H	H	C ₂ H ₅
30.	CN	H	H	C ₂ H ₅
10 31.	CF ₃	H	H	C ₂ H ₅
32.	OCF ₃	H	H	C ₂ H ₅
33.	OCHF ₂	H	H	C ₂ H ₅
34.	Cl	H	H	n-C ₃ H ₇
35.	Br	H	H	n-C ₃ H ₇
36.	F	H	H	n-C ₃ H ₇
15 37.	CH ₃	H	H	n-C ₃ H ₇
38.	C ₂ H ₅	H	H	n-C ₃ H ₇
39.	CH(CH ₃) ₂	H	H	n-C ₃ H ₇
40.	OCH ₃	H	H	n-C ₃ H ₇
41.	CN	H	H	n-C ₃ H ₇
20 42.	CF ₃	H	H	n-C ₃ H ₇
43.	OCF ₃	H	H	n-C ₃ H ₇
44.	OCHF ₂	H	H	n-C ₃ H ₇
45.	Cl	H	H	CH(CH ₃) ₂
46.	Br	H	H	CH(CH ₃) ₂
47.	F	H	H	CH(CH ₃) ₂
25 48.	CH ₃	H	H	CH(CH ₃) ₂
49.	C ₂ H ₅	H	H	CH(CH ₃) ₂
50.	CH(CH ₃) ₂	H	H	CH(CH ₃) ₂
51.	OCH ₃	H	H	CH(CH ₃) ₂
52.	CN	H	H	CH(CH ₃) ₂
30 53.	CF ₃	H	H	CH(CH ₃) ₂
54.	OCF ₃	H	H	CH(CH ₃) ₂
55.	OCHF ₂	H	H	CH(CH ₃) ₂
56.	Cl	H	H	n-C ₄ H ₉
57.	Br	H	H	n-C ₄ H ₉
58.	F	H	H	n-C ₄ H ₉
35 59.	CH ₃	H	H	n-C ₄ H ₉
60.	C ₂ H ₅	H	H	n-C ₄ H ₉
61.	CH(CH ₃) ₂	H	H	n-C ₄ H ₉
62.	OCH ₃	H	H	n-C ₄ H ₉
63.	CN	H	H	n-C ₄ H ₉
40 64.	CF ₃	H	H	n-C ₄ H ₉
65.	OCF ₃	H	H	n-C ₄ H ₉
66.	OCHF ₂	H	H	n-C ₄ H ₉
67.	Cl	H	H	C(CH ₃) ₃
68.	Br	H	H	C(CH ₃) ₃
69.	F	H	H	C(CH ₃) ₃
45 70.	CH ₃	H	H	C(CH ₃) ₃
71.	C ₂ H ₅	H	H	C(CH ₃) ₃
72.	CH(CH ₃) ₂	H	H	C(CH ₃) ₃
73.	OCH ₃	H	H	C(CH ₃) ₃

No.	R ^b	R ^c	R ^d	R ²
74.	CN	H	H	C(CH ₃) ₃
75.	CF ₃	H	H	C(CH ₃) ₃
76.	OCF ₃	H	H	C(CH ₃) ₃
5 77.	OCHF ₂	H	H	C(CH ₃) ₃
78.	Cl	H	H	C ₆ H ₅
79.	Br	H	H	C ₆ H ₅
80.	F	H	H	C ₆ H ₅
81.	CH ₃	H	H	C ₆ H ₅
82.	C ₂ H ₅	H	H	C ₆ H ₅
10 83.	CH(CH ₃) ₂	H	H	C ₆ H ₅
84.	OCH ₃	H	H	C ₆ H ₅
85.	CN	H	H	C ₆ H ₅
86.	CF ₃	H	H	C ₆ H ₅
87.	OCF ₃	H	H	C ₆ H ₅
15 88.	OCHF ₂	H	H	C ₆ H ₅
89.	Cl	H	H	cyclopropyl
90.	Br	H	H	cyclopropyl
91.	F	H	H	cyclopropyl
92.	CH ₃	H	H	cyclopropyl
93.	C ₂ H ₅	H	H	cyclopropyl
20 94.	CH(CH ₃) ₂	H	H	cyclopropyl
95.	OCH ₃	H	H	cyclopropyl
96.	CN	H	H	cyclopropyl
97.	CF ₃	H	H	cyclopropyl
98.	OCF ₃	H	H	cyclopropyl
25 99.	OCHF ₂	H	H	cyclopropyl
100.	Cl	H	H	CH ₂ -cyclopropyl
101.	Br	H	H	CH ₂ -cyclopropyl
102.	F	H	H	CH ₂ -cyclopropyl
103.	CH ₃	H	H	CH ₂ -cyclopropyl
104.	C ₂ H ₅	H	H	CH ₂ -cyclopropyl
30 105.	CH(CH ₃) ₂	H	H	CH ₂ -cyclopropyl
106.	OCH ₃	H	H	CH ₂ -cyclopropyl
107.	CN	H	H	CH ₂ -cyclopropyl
108.	CF ₃	H	H	CH ₂ -cyclopropyl
109.	OCF ₃	H	H	CH ₂ -cyclopropyl
35 110.	OCHF ₂	H	H	CH ₂ -cyclopropyl
111.	Cl	H	H	cyclobutyl
112.	Br	H	H	cyclobutyl
113.	F	H	H	cyclobutyl
114.	CH ₃	H	H	cyclobutyl
115.	C ₂ H ₅	H	H	cyclobutyl
40 116.	CH(CH ₃) ₂	H	H	cyclobutyl
117.	OCH ₃	H	H	cyclobutyl
118.	CN	H	H	cyclobutyl
119.	CF ₃	H	H	cyclobutyl
120.	OCF ₃	H	H	cyclobutyl
45 121.	OCHF ₂	H	H	cyclobutyl
122.	Cl	H	H	cyclopentyl
123.	Br	H	H	cyclopentyl
124.	F	H	H	cyclopentyl

No.	R ^b	R ^c	R ^d	R ²
125.	CH ₃	H	H	cyclopentyl
126.	C ₂ H ₅	H	H	cyclopentyl
127.	CH(CH ₃) ₂	H	H	cyclopentyl
5 128.	OCH ₃	H	H	cyclopentyl
129.	CN	H	H	cyclopentyl
130.	CF ₃	H	H	cyclopentyl
131.	OCF ₃	H	H	cyclopentyl
132.	OCHF ₂	H	H	cyclopentyl
133.	Cl	H	H	cyclohexyl
10 134.	Br	H	H	cyclohexyl
135.	F	H	H	cyclohexyl
136.	CH ₃	H	H	cyclohexyl
137.	C ₂ H ₅	H	H	cyclohexyl
138.	CH(CH ₃) ₂	H	H	cyclohexyl
15 139.	OCH ₃	H	H	cyclohexyl
140.	CN	H	H	cyclohexyl
141.	CF ₃	H	H	cyclohexyl
142.	OCF ₃	H	H	cyclohexyl
143.	OCHF ₂	H	H	cyclohexyl
144.	H	Cl	H	H
20 145.	H	Br	H	H
146.	H	F	H	H
147.	H	CH ₃	H	H
148.	H	C ₂ H ₅	H	H
149.	H	CH(CH ₃) ₂	H	H
25 150.	H	OCH ₃	H	H
151.	H	CN	H	H
152.	H	CF ₃	H	H
153.	H	OCF ₃	H	H
154.	H	OCHF ₂	H	H
155.	H	Cl	H	CH ₃
30 156.	H	Br	H	CH ₃
157.	H	F	H	CH ₃
158.	H	CH ₃	H	CH ₃
159.	H	C ₂ H ₅	H	CH ₃
160.	H	CH(CH ₃) ₂	H	CH ₃
35 161.	H	OCH ₃	H	CH ₃
162.	H	CN	H	CH ₃
163.	H	CF ₃	H	CH ₃
164.	H	OCF ₃	H	CH ₃
165.	H	OCHF ₂	H	CH ₃
166.	H	Cl	H	C ₂ H ₅
40 167.	H	Br	H	C ₂ H ₅
168.	H	F	H	C ₂ H ₅
169.	H	CH ₃	H	C ₂ H ₅
170.	H	C ₂ H ₅	H	C ₂ H ₅
171.	H	CH(CH ₃) ₂	H	C ₂ H ₅
45 172.	H	OCH ₃	H	C ₂ H ₅
173.	H	CN	H	C ₂ H ₅
174.	H	CF ₃	H	C ₂ H ₅
175.	H	OCF ₃	H	C ₂ H ₅

	No.	R ^b	R ^c	R ^d	R ²
	176.	H	OCHF ₂	H	C ₂ H ₅
	177.	H	Cl	H	n-C ₃ H ₇
	178.	H	Br	H	n-C ₃ H ₇
5	179.	H	F	H	n-C ₃ H ₇
	180.	H	CH ₃	H	n-C ₃ H ₇
	181.	H	C ₂ H ₅	H	n-C ₃ H ₇
	182.	H	CH(CH ₃) ₂	H	n-C ₃ H ₇
	183.	H	OCH ₃	H	n-C ₃ H ₇
	184.	H	CN	H	n-C ₃ H ₇
10	185.	H	CF ₃	H	n-C ₃ H ₇
	186.	H	OCF ₃	H	n-C ₃ H ₇
	187.	H	OCHF ₂	H	n-C ₃ H ₇
	188.	H	Cl	H	CH(CH ₃) ₂
	189.	H	Br	H	CH(CH ₃) ₂
15	190.	H	F	H	CH(CH ₃) ₂
	191.	H	CH ₃	H	CH(CH ₃) ₂
	192.	H	C ₂ H ₅	H	CH(CH ₃) ₂
	193.	H	CH(CH ₃) ₂	H	CH(CH ₃) ₂
	194.	H	OCH ₃	H	CH(CH ₃) ₂
	195.	H	CN	H	CH(CH ₃) ₂
20	196.	H	CF ₃	H	CH(CH ₃) ₂
	197.	H	OCF ₃	H	CH(CH ₃) ₂
	198.	H	OCHF ₂	H	CH(CH ₃) ₂
	199.	H	Cl	H	n-C ₄ H ₉
	200.	H	Br	H	n-C ₄ H ₉
25	201.	H	F	H	n-C ₄ H ₉
	202.	H	CH ₃	H	n-C ₄ H ₉
	203.	H	C ₂ H ₅	H	n-C ₄ H ₉
	204.	H	CH(CH ₃) ₂	H	n-C ₄ H ₉
	205.	H	OCH ₃	H	n-C ₄ H ₉
	206.	H	CN	H	n-C ₄ H ₉
30	207.	H	CF ₃	H	n-C ₄ H ₉
	208.	H	OCF ₃	H	n-C ₄ H ₉
	209.	H	OCHF ₂	H	n-C ₄ H ₉
	210.	H	Cl	H	C(CH ₃) ₃
	211.	H	Br	H	C(CH ₃) ₃
35	212.	H	F	H	C(CH ₃) ₃
	213.	H	CH ₃	H	C(CH ₃) ₃
	214.	H	C ₂ H ₅	H	C(CH ₃) ₃
	215.	H	CH(CH ₃) ₂	H	C(CH ₃) ₃
	216.	H	OCH ₃	H	C(CH ₃) ₃
	217.	H	CN	H	C(CH ₃) ₃
40	218.	H	CF ₃	H	C(CH ₃) ₃
	219.	H	OCF ₃	H	C(CH ₃) ₃
	220.	H	OCHF ₂	H	C(CH ₃) ₃
	221.	H	Cl	H	C ₆ H ₅
	222.	H	Br	H	C ₆ H ₅
45	223.	H	F	H	C ₆ H ₅
	224.	H	CH ₃	H	C ₆ H ₅
	225.	H	C ₂ H ₅	H	C ₆ H ₅
	226.	H	CH(CH ₃) ₂	H	C ₆ H ₅

No.	R ^b	R ^c	R ^d	R ²
227.	H	OCH ₃	H	C ₆ H ₅
228.	H	CN	H	C ₆ H ₅
229.	H	CF ₃	H	C ₆ H ₅
230.	H	OCF ₃	H	C ₆ H ₅
231.	H	OCHF ₂	H	C ₆ H ₅
232.	H	Cl	H	cyclopropyl
233.	H	Br	H	cyclopropyl
234.	H	F	H	cyclopropyl
235.	H	CH ₃	H	cyclopropyl
236.	H	C ₂ H ₅	H	cyclopropyl
237.	H	CH(CH ₃) ₂	H	cyclopropyl
238.	H	OCH ₃	H	cyclopropyl
239.	H	CN	H	cyclopropyl
240.	H	CF ₃	H	cyclopropyl
241.	H	OCF ₃	H	cyclopropyl
242.	H	OCHF ₂	H	cyclopropyl
243.	H	Cl	H	CH ₂ -cyclopropyl
244.	H	Br	H	CH ₂ -cyclopropyl
245.	H	F	H	CH ₂ -cyclopropyl
246.	H	CH ₃	H	CH ₂ -cyclopropyl
247.	H	C ₂ H ₅	H	CH ₂ -cyclopropyl
248.	H	CH(CH ₃) ₂	H	CH ₂ -cyclopropyl
249.	H	OCH ₃	H	CH ₂ -cyclopropyl
250.	H	CN	H	CH ₂ -cyclopropyl
251.	H	CF ₃	H	CH ₂ -cyclopropyl
252.	H	OCF ₃	H	CH ₂ -cyclopropyl
253.	H	OCHF ₂	H	CH ₂ -cyclopropyl
254.	H	Cl	H	cyclobutyl
255.	H	Br	H	cyclobutyl
256.	H	F	H	cyclobutyl
257.	H	CH ₃	H	cyclobutyl
258.	H	C ₂ H ₅	H	cyclobutyl
259.	H	CH(CH ₃) ₂	H	cyclobutyl
260.	H	OCH ₃	H	cyclobutyl
261.	H	CN	H	cyclobutyl
262.	H	CF ₃	H	cyclobutyl
263.	H	OCF ₃	H	cyclobutyl
264.	H	OCHF ₂	H	cyclobutyl
265.	H	Cl	H	cyclopentyl
266.	H	Br	H	cyclopentyl
267.	H	F	H	cyclopentyl
268.	H	CH ₃	H	cyclopentyl
269.	H	C ₂ H ₅	H	cyclopentyl
270.	H	CH(CH ₃) ₂	H	cyclopentyl
271.	H	OCH ₃	H	cyclopentyl
272.	H	CN	H	cyclopentyl
273.	H	CF ₃	H	cyclopentyl
274.	H	OCF ₃	H	cyclopentyl
275.	H	OCHF ₂	H	cyclopentyl
276.	H	Cl	H	cyclohexyl
277.	H	Br	H	cyclohexyl

No.	R ^b	R ^c	R ^d	R ²
278.	H	F	H	cyclohexyl
279.	H	CH ₃	H	cyclohexyl
280.	H	C ₂ H ₅	H	cyclohexyl
281.	H	CH(CH ₃) ₂	H	cyclohexyl
282.	H	OCH ₃	H	cyclohexyl
283.	H	CN	H	cyclohexyl
284.	H	CF ₃	H	cyclohexyl
285.	H	OCF ₃	H	cyclohexyl
286.	H	OCHF ₂	H	cyclohexyl
287.	CF ₃	Br	H	H
288.	CF ₃	OCH ₃	H	H
289.	CF ₃	Cl	H	H
290.	CF ₃	F	H	H
291.	CF ₃	CH ₃	H	H
292.	CF ₃	C ₂ H ₅	H	H
293.	CF ₃	CF ₃	H	H
294.	CF ₃	OCF ₃	H	H
295.	CF ₃	OCHF ₂	H	H
296.	CF ₃	Br	H	CH ₃
297.	CF ₃	OCH ₃	H	CH ₃
298.	CF ₃	Cl	H	CH ₃
299.	CF ₃	F	H	CH ₃
300.	CF ₃	CH ₃	H	CH ₃
301.	CF ₃	C ₂ H ₅	H	CH ₃
302.	CF ₃	CF ₃	H	CH ₃
303.	CF ₃	OCF ₃	H	CH ₃
304.	CF ₃	OCHF ₂	H	CH ₃
305.	CF ₃	Br	H	C ₂ H ₅
306.	CF ₃	OCH ₃	H	C ₂ H ₅
307.	CF ₃	Cl	H	C ₂ H ₅
308.	CF ₃	F	H	C ₂ H ₅
309.	CF ₃	CH ₃	H	C ₂ H ₅
310.	CF ₃	C ₂ H ₅	H	C ₂ H ₅
311.	CF ₃	CF ₃	H	C ₂ H ₅
312.	CF ₃	OCF ₃	H	C ₂ H ₅
313.	CF ₃	OCHF ₂	H	C ₂ H ₅
314.	CF ₃	Br	H	n-C ₃ H ₇
315.	CF ₃	OCH ₃	H	n-C ₃ H ₇
316.	CF ₃	Cl	H	n-C ₃ H ₇
317.	CF ₃	F	H	n-C ₃ H ₇
318.	CF ₃	CH ₃	H	n-C ₃ H ₇
319.	CF ₃	C ₂ H ₅	H	n-C ₃ H ₇
320.	CF ₃	CF ₃	H	n-C ₃ H ₇
321.	CF ₃	OCF ₃	H	n-C ₃ H ₇
322.	CF ₃	OCHF ₂	H	n-C ₃ H ₇
323.	CF ₃	Br	H	CH(CH ₃) ₂
324.	CF ₃	OCH ₃	H	CH(CH ₃) ₂
325.	CF ₃	Cl	H	CH(CH ₃) ₂
326.	CF ₃	F	H	CH(CH ₃) ₂
327.	CF ₃	CH ₃	H	CH(CH ₃) ₂
328.	CF ₃	C ₂ H ₅	H	CH(CH ₃) ₂

No.	R ^b	R ^c	R ^d	R ²
329.	CF ₃	CF ₃	H	CH(CH ₃) ₂
330.	CF ₃	OCF ₃	H	CH(CH ₃) ₂
331.	CF ₃	OCHF ₂	H	CH(CH ₃) ₂
5 332.	CF ₃	Br	H	n-C ₄ H ₉
333.	CF ₃	OCH ₃	H	n-C ₄ H ₉
334.	CF ₃	Cl	H	n-C ₄ H ₉
335.	CF ₃	F	H	n-C ₄ H ₉
336.	CF ₃	CH ₃	H	n-C ₄ H ₉
10 337.	CF ₃	C ₂ H ₅	H	n-C ₄ H ₉
338.	CF ₃	CF ₃	H	n-C ₄ H ₉
339.	CF ₃	OCF ₃	H	n-C ₄ H ₉
340.	CF ₃	OCHF ₂	H	n-C ₄ H ₉
341.	CF ₃	Br	H	C(CH ₃) ₃
342.	CF ₃	OCH ₃	H	C(CH ₃) ₃
15 343.	CF ₃	Cl	H	C(CH ₃) ₃
344.	CF ₃	F	H	C(CH ₃) ₃
345.	CF ₃	CH ₃	H	C(CH ₃) ₃
346.	CF ₃	C ₂ H ₅	H	C(CH ₃) ₃
347.	CF ₃	CF ₃	H	C(CH ₃) ₃
20 348.	CF ₃	OCF ₃	H	C(CH ₃) ₃
349.	CF ₃	OCHF ₂	H	C(CH ₃) ₃
350.	CF ₃	Br	H	C ₆ H ₅
351.	CF ₃	OCH ₃	H	C ₆ H ₅
352.	CF ₃	Cl	H	C ₆ H ₅
353.	CF ₃	F	H	C ₆ H ₅
25 354.	CF ₃	CH ₃	H	C ₆ H ₅
355.	CF ₃	C ₂ H ₅	H	C ₆ H ₅
356.	CF ₃	CF ₃	H	C ₆ H ₅
357.	CF ₃	OCF ₃	H	C ₆ H ₅
358.	CF ₃	OCHF ₂	H	C ₆ H ₅
30 359.	CF ₃	Br	H	cyclopropyl
360.	CF ₃	OCH ₃	H	cyclopropyl
361.	CF ₃	Cl	H	cyclopropyl
362.	CF ₃	F	H	cyclopropyl
363.	CF ₃	CH ₃	H	cyclopropyl
364.	CF ₃	C ₂ H ₅	H	cyclopropyl
35 365.	CF ₃	CF ₃	H	cyclopropyl
366.	CF ₃	OCF ₃	H	cyclopropyl
367.	CF ₃	OCHF ₂	H	cyclopropyl
368.	CF ₃	Br	H	CH ₂ -cyclopropyl
369.	CF ₃	OCH ₃	H	CH ₂ -cyclopropyl
370.	CF ₃	Cl	H	CH ₂ -cyclopropyl
40 371.	CF ₃	F	H	CH ₂ -cyclopropyl
372.	CF ₃	CH ₃	H	CH ₂ -cyclopropyl
373.	CF ₃	C ₂ H ₅	H	CH ₂ -cyclopropyl
374.	CF ₃	CF ₃	H	CH ₂ -cyclopropyl
375.	CF ₃	OCF ₃	H	CH ₂ -cyclopropyl
45 376.	CF ₃	OCHF ₂	H	CH ₂ -cyclopropyl
377.	CF ₃	Br	H	cyclobutyl
378.	CF ₃	OCH ₃	H	cyclobutyl
379.	CF ₃	Cl	H	cyclobutyl

No.	R ^b	R ^c	R ^d	R ²
380.	CF ₃	F	H	cyclobutyl
381.	CF ₃	CH ₃	H	cyclobutyl
382.	CF ₃	C ₂ H ₅	H	cyclobutyl
5 383.	CF ₃	CF ₃	H	cyclobutyl
384.	CF ₃	OCF ₃	H	cyclobutyl
385.	CF ₃	OCHF ₂	H	cyclobutyl
386.	CF ₃	Br	H	cyclopentyl
387.	CF ₃	OCH ₃	H	cyclopentyl
388.	CF ₃	Cl	H	cyclopentyl
10 389.	CF ₃	F	H	cyclopentyl
390.	CF ₃	CH ₃	H	cyclopentyl
391.	CF ₃	C ₂ H ₅	H	cyclopentyl
392.	CF ₃	CF ₃	H	cyclopentyl
393.	CF ₃	OCF ₃	H	cyclopentyl
15 394.	CF ₃	OCHF ₂	H	cyclopentyl
395.	CF ₃	Br	H	cyclohexyl
396.	CF ₃	OCH ₃	H	cyclohexyl
397.	CF ₃	Cl	H	cyclohexyl
398.	CF ₃	F	H	cyclohexyl
399.	CF ₃	CH ₃	H	cyclohexyl
20 400.	CF ₃	C ₂ H ₅	H	cyclohexyl
401.	CF ₃	CF ₃	H	cyclohexyl
402.	CF ₃	OCF ₃	H	cyclohexyl
403.	CF ₃	OCHF ₂	H	cyclohexyl
404.	CF ₃	H	Br	H
25 405.	CF ₃	H	OCH ₃	H
406.	CF ₃	H	Cl	H
407.	CF ₃	H	F	H
408.	CF ₃	H	CH ₃	H
409.	CF ₃	H	C ₂ H ₅	H
410.	CF ₃	H	CF ₃	H
30 411.	CF ₃	H	OCF ₃	H
412.	CF ₃	H	OCHF ₂	H
413.	CF ₃	H	Br	CH ₃
414.	CF ₃	H	OCH ₃	CH ₃
415.	CF ₃	H	Cl	CH ₃
35 416.	CF ₃	H	F	CH ₃
417.	CF ₃	H	CH ₃	CH ₃
418.	CF ₃	H	C ₂ H ₅	CH ₃
419.	CF ₃	H	CF ₃	CH ₃
420.	CF ₃	H	OCF ₃	CH ₃
421.	CF ₃	H	OCHF ₂	CH ₃
40 422.	CF ₃	H	Br	C ₂ H ₅
423.	CF ₃	H	OCH ₃	C ₂ H ₅
424.	CF ₃	H	Cl	C ₂ H ₅
425.	CF ₃	H	F	C ₂ H ₅
426.	CF ₃	H	CH ₃	C ₂ H ₅
45 427.	CF ₃	H	C ₂ H ₅	C ₂ H ₅
428.	CF ₃	H	CF ₃	C ₂ H ₅
429.	CF ₃	H	OCF ₃	C ₂ H ₅
430.	CF ₃	H	OCHF ₂	C ₂ H ₅

No.	R ^b	R ^c	R ^d	R ²
431.	CF ₃	H	Br	n-C ₃ H ₇
432.	CF ₃	H	OCH ₃	n-C ₃ H ₇
433.	CF ₃	H	Cl	n-C ₃ H ₇
5 434.	CF ₃	H	F	n-C ₃ H ₇
435.	CF ₃	H	CH ₃	n-C ₃ H ₇
436.	CF ₃	H	C ₂ H ₅	n-C ₃ H ₇
437.	CF ₃	H	CF ₃	n-C ₃ H ₇
438.	CF ₃	H	OCF ₃	n-C ₃ H ₇
439.	CF ₃	H	OCHF ₂	n-C ₃ H ₇
10 440.	CF ₃	H	Br	CH(CH ₃) ₂
441.	CF ₃	H	OCH ₃	CH(CH ₃) ₂
442.	CF ₃	H	Cl	CH(CH ₃) ₂
443.	CF ₃	H	F	CH(CH ₃) ₂
444.	CF ₃	H	CH ₃	CH(CH ₃) ₂
15 445.	CF ₃	H	C ₂ H ₅	CH(CH ₃) ₂
446.	CF ₃	H	CF ₃	CH(CH ₃) ₂
447.	CF ₃	H	OCF ₃	CH(CH ₃) ₂
448.	CF ₃	H	OCHF ₂	CH(CH ₃) ₂
449.	CF ₃	H	Br	n-C ₄ H ₉
450.	CF ₃	H	OCH ₃	n-C ₄ H ₉
20 451.	CF ₃	H	Cl	n-C ₄ H ₉
452.	CF ₃	H	F	n-C ₄ H ₉
453.	CF ₃	H	CH ₃	n-C ₄ H ₉
454.	CF ₃	H	C ₂ H ₅	n-C ₄ H ₉
455.	CF ₃	H	CF ₃	n-C ₄ H ₉
25 456.	CF ₃	H	OCF ₃	n-C ₄ H ₉
457.	CF ₃	H	OCHF ₂	n-C ₄ H ₉
458.	CF ₃	H	Br	C(CH ₃) ₃
459.	CF ₃	H	OCH ₃	C(CH ₃) ₃
460.	CF ₃	H	Cl	C(CH ₃) ₃
461.	CF ₃	H	F	C(CH ₃) ₃
30 462.	CF ₃	H	CH ₃	C(CH ₃) ₃
463.	CF ₃	H	C ₂ H ₅	C(CH ₃) ₃
464.	CF ₃	H	CF ₃	C(CH ₃) ₃
465.	CF ₃	H	OCF ₃	C(CH ₃) ₃
466.	CF ₃	H	OCHF ₂	C(CH ₃) ₃
35 467.	CF ₃	H	Br	C ₆ H ₅
468.	CF ₃	H	OCH ₃	C ₆ H ₅
469.	CF ₃	H	Cl	C ₆ H ₅
470.	CF ₃	H	F	C ₆ H ₅
471.	CF ₃	H	CH ₃	C ₆ H ₅
472.	CF ₃	H	C ₂ H ₅	C ₆ H ₅
40 473.	CF ₃	H	CF ₃	C ₆ H ₅
474.	CF ₃	H	OCF ₃	C ₆ H ₅
475.	CF ₃	H	OCHF ₂	C ₆ H ₅
476.	CF ₃	H	Br	cyclopropyl
477.	CF ₃	H	OCH ₃	cyclopropyl
45 478.	CF ₃	H	Cl	cyclopropyl
479.	CF ₃	H	F	cyclopropyl
480.	CF ₃	H	CH ₃	cyclopropyl
481.	CF ₃	H	C ₂ H ₅	cyclopropyl

	No.	R ^b	R ^c	R ^d	R ²
5	482.	CF ₃	H	CF ₃	cyclopropyl
	483.	CF ₃	H	OCF ₃	cyclopropyl
	484.	CF ₃	H	OCHF ₂	cyclopropyl
	485.	CF ₃	H	Br	CH ₂ -cyclopropyl
	486.	CF ₃	H	OCH ₃	CH ₂ -cyclopropyl
	487.	CF ₃	H	Cl	CH ₂ -cyclopropyl
	488.	CF ₃	H	F	CH ₂ -cyclopropyl
	489.	CF ₃	H	CH ₃	CH ₂ -cyclopropyl
10	490.	CF ₃	H	C ₂ H ₅	CH ₂ -cyclopropyl
	491.	CF ₃	H	CF ₃	CH ₂ -cyclopropyl
	492.	CF ₃	H	OCF ₃	CH ₂ -cyclopropyl
	493.	CF ₃	H	OCHF ₂	CH ₂ -cyclopropyl
	494.	CF ₃	H	Br	cyclobutyl
15	495.	CF ₃	H	OCH ₃	cyclobutyl
	496.	CF ₃	H	Cl	cyclobutyl
	497.	CF ₃	H	F	cyclobutyl
	498.	CF ₃	H	CH ₃	cyclobutyl
	499.	CF ₃	H	C ₂ H ₅	cyclobutyl
	500.	CF ₃	H	CF ₃	cyclobutyl
20	501.	CF ₃	H	OCF ₃	cyclobutyl
	502.	CF ₃	H	OCHF ₂	cyclobutyl
	503.	CF ₃	H	Br	cyclopentyl
	504.	CF ₃	H	OCH ₃	cyclopentyl
	505.	CF ₃	H	Cl	cyclopentyl
25	506.	CF ₃	H	F	cyclopentyl
	507.	CF ₃	H	CH ₃	cyclopentyl
	508.	CF ₃	H	C ₂ H ₅	cyclopentyl
	509.	CF ₃	H	CF ₃	cyclopentyl
	510.	CF ₃	H	OCF ₃	cyclopentyl
	511.	CF ₃	H	OCHF ₂	cyclopentyl
30	512.	CF ₃	H	Br	cyclohexyl
	513.	CF ₃	H	OCH ₃	cyclohexyl
	514.	CF ₃	H	Cl	cyclohexyl
	515.	CF ₃	H	F	cyclohexyl
	516.	CF ₃	H	CH ₃	cyclohexyl
	517.	CF ₃	H	C ₂ H ₅	cyclohexyl
35	518.	CF ₃	H	CF ₃	cyclohexyl
	519.	CF ₃	H	OCF ₃	cyclohexyl
	520.	CF ₃	H	OCHF ₂	cyclohexyl
40	521.	OCF ₃	Br	H	H
	522.	OCF ₃	OCH ₃	H	H
	523.	OCF ₃	Cl	H	H
	524.	OCF ₃	F	H	H
	525.	OCF ₃	CH ₃	H	H
	526.	OCF ₃	C ₂ H ₅	H	H
	527.	OCF ₃	CF ₃	H	H
	528.	OCF ₃	OCF ₃	H	H
45	529.	OCF ₃	OCHF ₂	H	H
	530.	OCF ₃	Br	H	CH ₃
	531.	OCF ₃	OCH ₃	H	CH ₃
	532.	OCF ₃	Cl	H	CH ₃

No.	R ^b	R ^c	R ^d	R ²
533.	OCF ₃	F	H	CH ₃
534.	OCF ₃	CH ₃	H	CH ₃
535.	OCF ₃	C ₂ H ₅	H	CH ₃
536.	OCF ₃	CF ₃	H	CH ₃
537.	OCF ₃	OCF ₃	H	CH ₃
538.	OCF ₃	OCHF ₂	H	CH ₃
539.	OCF ₃	Br	H	C ₂ H ₅
540.	OCF ₃	OCH ₃	H	C ₂ H ₅
541.	OCF ₃	Cl	H	C ₂ H ₅
542.	OCF ₃	F	H	C ₂ H ₅
543.	OCF ₃	CH ₃	H	C ₂ H ₅
544.	OCF ₃	C ₂ H ₅	H	C ₂ H ₅
545.	OCF ₃	CF ₃	H	C ₂ H ₅
546.	OCF ₃	OCF ₃	H	C ₂ H ₅
547.	OCF ₃	OCHF ₂	H	C ₂ H ₅
548.	OCF ₃	Br	H	n-C ₃ H ₇
549.	OCF ₃	OCH ₃	H	n-C ₃ H ₇
550.	OCF ₃	Cl	H	n-C ₃ H ₇
551.	OCF ₃	F	H	n-C ₃ H ₇
552.	OCF ₃	CH ₃	H	n-C ₃ H ₇
553.	OCF ₃	C ₂ H ₅	H	n-C ₃ H ₇
554.	OCF ₃	CF ₃	H	n-C ₃ H ₇
555.	OCF ₃	OCF ₃	H	n-C ₃ H ₇
556.	OCF ₃	OCHF ₂	H	n-C ₃ H ₇
557.	OCF ₃	Br	H	CH(CH ₃) ₂
558.	OCF ₃	OCH ₃	H	CH(CH ₃) ₂
559.	OCF ₃	Cl	H	CH(CH ₃) ₂
560.	OCF ₃	F	H	CH(CH ₃) ₂
561.	OCF ₃	CH ₃	H	CH(CH ₃) ₂
562.	OCF ₃	C ₂ H ₅	H	CH(CH ₃) ₂
563.	OCF ₃	CF ₃	H	CH(CH ₃) ₂
564.	OCF ₃	OCF ₃	H	CH(CH ₃) ₂
565.	OCF ₃	OCHF ₂	H	CH(CH ₃) ₂
566.	OCF ₃	Br	H	n-C ₄ H ₉
567.	OCF ₃	OCH ₃	H	n-C ₄ H ₉
568.	OCF ₃	Cl	H	n-C ₄ H ₉
569.	OCF ₃	F	H	n-C ₄ H ₉
570.	OCF ₃	CH ₃	H	n-C ₄ H ₉
571.	OCF ₃	C ₂ H ₅	H	n-C ₄ H ₉
572.	OCF ₃	CF ₃	H	n-C ₄ H ₉
573.	OCF ₃	OCF ₃	H	n-C ₄ H ₉
574.	OCF ₃	OCHF ₂	H	n-C ₄ H ₉
575.	OCF ₃	Br	H	C(CH ₃) ₃
576.	OCF ₃	OCH ₃	H	C(CH ₃) ₃
577.	OCF ₃	Cl	H	C(CH ₃) ₃
578.	OCF ₃	F	H	C(CH ₃) ₃
579.	OCF ₃	CH ₃	H	C(CH ₃) ₃
580.	OCF ₃	C ₂ H ₅	H	C(CH ₃) ₃
581.	OCF ₃	CF ₃	H	C(CH ₃) ₃
582.	OCF ₃	OCF ₃	H	C(CH ₃) ₃
583.	OCF ₃	OCHF ₂	H	C(CH ₃) ₃

No.	R ^b	R ^c	R ^d	R ²
584.	OCF ₃	Br	H	C ₆ H ₅
585.	OCF ₃	OCH ₃	H	C ₆ H ₅
586.	OCF ₃	Cl	H	C ₆ H ₅
587.	OCF ₃	F	H	C ₆ H ₅
588.	OCF ₃	CH ₃	H	C ₆ H ₅
589.	OCF ₃	C ₂ H ₅	H	C ₆ H ₅
590.	OCF ₃	CF ₃	H	C ₆ H ₅
591.	OCF ₃	OCF ₃	H	C ₆ H ₅
592.	OCF ₃	OCHF ₂	H	C ₆ H ₅
593.	OCF ₃	Br	H	cyclopropyl
594.	OCF ₃	OCH ₃	H	cyclopropyl
595.	OCF ₃	Cl	H	cyclopropyl
596.	OCF ₃	F	H	cyclopropyl
597.	OCF ₃	CH ₃	H	cyclopropyl
598.	OCF ₃	C ₂ H ₅	H	cyclopropyl
599.	OCF ₃	CF ₃	H	cyclopropyl
600.	OCF ₃	OCF ₃	H	cyclopropyl
601.	OCF ₃	OCHF ₂	H	cyclopropyl
602.	OCF ₃	Br	H	CH ₂ -cyclopropyl
603.	OCF ₃	OCH ₃	H	CH ₂ -cyclopropyl
604.	OCF ₃	Cl	H	CH ₂ -cyclopropyl
605.	OCF ₃	F	H	CH ₂ -cyclopropyl
606.	OCF ₃	CH ₃	H	CH ₂ -cyclopropyl
607.	OCF ₃	C ₂ H ₅	H	CH ₂ -cyclopropyl
608.	OCF ₃	OCF ₃	H	CH ₂ -cyclopropyl
609.	OCF ₃	CF ₃	H	CH ₂ -cyclopropyl
610.	OCF ₃	OCHF ₂	H	CH ₂ -cyclopropyl
611.	OCF ₃	Br	H	cyclobutyl
612.	OCF ₃	OCH ₃	H	cyclobutyl
613.	OCF ₃	Cl	H	cyclobutyl
614.	OCF ₃	F	H	cyclobutyl
615.	OCF ₃	CH ₃	H	cyclobutyl
616.	OCF ₃	C ₂ H ₅	H	cyclobutyl
617.	OCF ₃	OCF ₃	H	cyclobutyl
618.	OCF ₃	CF ₃	H	cyclobutyl
619.	OCF ₃	OCHF ₂	H	cyclobutyl
620.	OCF ₃	Br	H	cyclopentyl
621.	OCF ₃	OCH ₃	H	cyclopentyl
622.	OCF ₃	Cl	H	cyclopentyl
623.	OCF ₃	F	H	cyclopentyl
624.	OCF ₃	CH ₃	H	cyclopentyl
625.	OCF ₃	C ₂ H ₅	H	cyclopentyl
626.	OCF ₃	OCF ₃	H	cyclopentyl
627.	OCF ₃	CF ₃	H	cyclopentyl
628.	OCF ₃	OCHF ₂	H	cyclopentyl
629.	OCF ₃	Br	H	cyclohexyl
630.	OCF ₃	OCH ₃	H	cyclohexyl
631.	OCF ₃	Cl	H	cyclohexyl
632.	OCF ₃	F	H	cyclohexyl
633.	OCF ₃	CH ₃	H	cyclohexyl
634.	OCF ₃	C ₂ H ₅	H	cyclohexyl

No.	R ^b	R ^c	R ^d	R ²
635.	OCF ₃	OCF ₃	H	cyclohexyl
636.	OCF ₃	CF ₃	H	cyclohexyl
637.	OCF ₃	OCHF ₂	H	cyclohexyl
5 638.	OCF ₃	H	Br	H
639.	OCF ₃	H	OCH ₃	H
640.	OCF ₃	H	Cl	H
641.	OCF ₃	H	F	H
642.	OCF ₃	H	CH ₃	H
643.	OCF ₃	H	C ₂ H ₅	H
10 644.	OCF ₃	H	CF ₃	H
645.	OCF ₃	H	OCF ₃	H
646.	OCF ₃	H	OCHF ₂	H
647.	OCF ₃	H	Br	CH ₃
648.	OCF ₃	H	OCH ₃	CH ₃
15 649.	OCF ₃	H	Cl	CH ₃
650.	OCF ₃	H	F	CH ₃
651.	OCF ₃	H	CH ₃	CH ₃
652.	OCF ₃	H	C ₂ H ₅	CH ₃
653.	OCF ₃	H	CF ₃	CH ₃
654.	OCF ₃	H	OCF ₃	CH ₃
20 655.	OCF ₃	H	OCHF ₂	CH ₃
656.	OCF ₃	H	Br	C ₂ H ₅
657.	OCF ₃	H	OCH ₃	C ₂ H ₅
658.	OCF ₃	H	Cl	C ₂ H ₅
659.	OCF ₃	H	F	C ₂ H ₅
25 660.	OCF ₃	H	CH ₃	C ₂ H ₅
661.	OCF ₃	H	C ₂ H ₅	C ₂ H ₅
662.	OCF ₃	H	CF ₃	C ₂ H ₅
663.	OCF ₃	H	OCF ₃	C ₂ H ₅
664.	OCF ₃	H	OCHF ₂	C ₂ H ₅
665.	OCF ₃	H	Br	n-C ₃ H ₇
30 666.	OCF ₃	H	OCH ₃	n-C ₃ H ₇
667.	OCF ₃	H	Cl	n-C ₃ H ₇
668.	OCF ₃	H	F	n-C ₃ H ₇
669.	OCF ₃	H	CH ₃	n-C ₃ H ₇
670.	OCF ₃	H	C ₂ H ₅	n-C ₃ H ₇
35 671.	OCF ₃	H	CF ₃	n-C ₃ H ₇
672.	OCF ₃	H	OCF ₃	n-C ₃ H ₇
673.	OCF ₃	H	OCHF ₂	n-C ₃ H ₇
674.	OCF ₃	H	Br	CH(CH ₃) ₂
675.	OCF ₃	H	OCH ₃	CH(CH ₃) ₂
676.	OCF ₃	H	Cl	CH(CH ₃) ₂
40 677.	OCF ₃	H	F	CH(CH ₃) ₂
678.	OCF ₃	H	CH ₃	CH(CH ₃) ₂
679.	OCF ₃	H	C ₂ H ₅	CH(CH ₃) ₂
680.	OCF ₃	H	CF ₃	CH(CH ₃) ₂
681.	OCF ₃	H	OCF ₃	CH(CH ₃) ₂
45 682.	OCF ₃	H	OCHF ₂	CH(CH ₃) ₂
683.	OCF ₃	H	Br	n-C ₄ H ₉
684.	OCF ₃	H	OCH ₃	n-C ₄ H ₉
685.	OCF ₃	H	Cl	n-C ₄ H ₉

No.	R ^b	R ^c	R ^d	R ²
686.	OCF ₃	H	F	n-C ₄ H ₉
687.	OCF ₃	H	CH ₃	n-C ₄ H ₉
688.	OCF ₃	H	C ₂ H ₅	n-C ₄ H ₉
5 689.	OCF ₃	H	CF ₃	n-C ₄ H ₉
690.	OCF ₃	H	OCF ₃	n-C ₄ H ₉
691.	OCF ₃	H	OCHF ₂	n-C ₄ H ₉
692.	OCF ₃	H	Br	C(CH ₃) ₃
693.	OCF ₃	H	OCH ₃	C(CH ₃) ₃
694.	OCF ₃	H	Cl	C(CH ₃) ₃
10 695.	OCF ₃	H	F	C(CH ₃) ₃
696.	OCF ₃	H	CH ₃	C(CH ₃) ₃
697.	OCF ₃	H	C ₂ H ₅	C(CH ₃) ₃
698.	OCF ₃	H	CF ₃	C(CH ₃) ₃
699.	OCF ₃	H	OCF ₃	C(CH ₃) ₃
15 700.	OCF ₃	H	OCHF ₂	C(CH ₃) ₃
701.	OCF ₃	H	Br	C ₆ H ₅
702.	OCF ₃	H	OCH ₃	C ₆ H ₅
703.	OCF ₃	H	Cl	C ₆ H ₅
704.	OCF ₃	H	F	C ₆ H ₅
705.	OCF ₃	H	CH ₃	C ₆ H ₅
20 706.	OCF ₃	H	C ₂ H ₅	C ₆ H ₅
707.	OCF ₃	H	CF ₃	C ₆ H ₅
708.	OCF ₃	H	OCF ₃	C ₆ H ₅
709.	OCF ₃	H	OCHF ₂	C ₆ H ₅
710.	OCF ₃	H	Br	cyclopropyl
25 711.	OCF ₃	H	OCH ₃	cyclopropyl
712.	OCF ₃	H	Cl	cyclopropyl
713.	OCF ₃	H	F	cyclopropyl
714.	OCF ₃	H	CH ₃	cyclopropyl
715.	OCF ₃	H	C ₂ H ₅	cyclopropyl
716.	OCF ₃	H	CF ₃	cyclopropyl
30 717.	OCF ₃	H	OCF ₃	cyclopropyl
718.	OCF ₃	H	OCHF ₂	cyclopropyl
719.	OCF ₃	H	Br	CH ₂ -cyclopropyl
720.	OCF ₃	H	OCH ₃	CH ₂ -cyclopropyl
721.	OCF ₃	H	Cl	CH ₂ -cyclopropyl
35 722.	OCF ₃	H	F	CH ₂ -cyclopropyl
723.	OCF ₃	H	CH ₃	CH ₂ -cyclopropyl
724.	OCF ₃	H	C ₂ H ₅	CH ₂ -cyclopropyl
725.	OCF ₃	H	CF ₃	CH ₂ -cyclopropyl
726.	OCF ₃	H	OCF ₃	CH ₂ -cyclopropyl
727.	OCF ₃	H	OCHF ₂	CH ₂ -cyclopropyl
40 728.	OCF ₃	H	Br	cyclobutyl
729.	OCF ₃	H	OCH ₃	cyclobutyl
730.	OCF ₃	H	Cl	cyclobutyl
731.	OCF ₃	H	F	cyclobutyl
732.	OCF ₃	H	CH ₃	cyclobutyl
45 733.	OCF ₃	H	C ₂ H ₅	cyclobutyl
734.	OCF ₃	H	CF ₃	cyclobutyl
735.	OCF ₃	H	OCF ₃	cyclobutyl
736.	OCF ₃	H	OCHF ₂	cyclobutyl

No.	R ^b	R ^c	R ^d	R ²
737.	OCF ₃	H	Br	cyclopentyl
738.	OCF ₃	H	OCH ₃	cyclopentyl
739.	OCF ₃	H	Cl	cyclopentyl
5 740.	OCF ₃	H	F	cyclopentyl
741.	OCF ₃	H	CH ₃	cyclopentyl
742.	OCF ₃	H	C ₂ H ₅	cyclopentyl
743.	OCF ₃	H	CF ₃	cyclopentyl
744.	OCF ₃	H	OCF ₃	cyclopentyl
745.	OCF ₃	H	OCHF ₂	cyclopentyl
10 746.	OCF ₃	H	Br	cyclohexyl
747.	OCF ₃	H	OCH ₃	cyclohexyl
748.	OCF ₃	H	Cl	cyclohexyl
749.	OCF ₃	H	F	cyclohexyl
750.	OCF ₃	H	CH ₃	cyclohexyl
15 751.	OCF ₃	H	C ₂ H ₅	cyclohexyl
752.	OCF ₃	H	CF ₃	cyclohexyl
753.	OCF ₃	H	OCF ₃	cyclohexyl
754.	OCF ₃	H	OCHF ₂	cyclohexyl
755.	OCHF ₂	Br	H	H
756.	OCHF ₂	OCH ₃	H	H
20 757.	OCHF ₂	Cl	H	H
758.	OCHF ₂	F	H	H
759.	OCHF ₂	CH ₃	H	H
760.	OCHF ₂	C ₂ H ₅	H	H
761.	OCHF ₂	OCF ₃	H	H
25 762.	OCHF ₂	CF ₃	H	H
763.	OCHF ₂	Br	H	CH ₃
764.	OCHF ₂	OCH ₃	H	CH ₃
765.	OCHF ₂	Cl	H	CH ₃
766.	OCHF ₂	F	H	CH ₃
767.	OCHF ₂	CH ₃	H	CH ₃
30 768.	OCHF ₂	C ₂ H ₅	H	CH ₃
769.	OCHF ₂	OCF ₃	H	CH ₃
770.	OCHF ₂	CF ₃	H	CH ₃
771.	OCHF ₂	Br	H	C ₂ H ₅
772.	OCHF ₂	OCH ₃	H	C ₂ H ₅
35 773.	OCHF ₂	Cl	H	C ₂ H ₅
774.	OCHF ₂	F	H	C ₂ H ₅
775.	OCHF ₂	CH ₃	H	C ₂ H ₅
776.	OCHF ₂	C ₂ H ₅	H	C ₂ H ₅
777.	OCHF ₂	OCF ₃	H	C ₂ H ₅
778.	OCHF ₂	CF ₃	H	C ₂ H ₅
40 779.	OCHF ₂	Br	H	n-C ₃ H ₇
780.	OCHF ₂	OCH ₃	H	n-C ₃ H ₇
781.	OCHF ₂	Cl	H	n-C ₃ H ₇
782.	OCHF ₂	F	H	n-C ₃ H ₇
783.	OCHF ₂	CH ₃	H	n-C ₃ H ₇
45 784.	OCHF ₂	C ₂ H ₅	H	n-C ₃ H ₇
785.	OCHF ₂	OCF ₃	H	n-C ₃ H ₇
786.	OCHF ₂	CF ₃	H	n-C ₃ H ₇
787.	OCHF ₂	Br	H	CH(CH ₃) ₂

No.	R ^b	R ^c	R ^d	R ²
788.	OCHF ₂	OCH ₃	H	CH(CH ₃) ₂
789.	OCHF ₂	Cl	H	CH(CH ₃) ₂
790.	OCHF ₂	F	H	CH(CH ₃) ₂
5 791.	OCHF ₂	CH ₃	H	CH(CH ₃) ₂
792.	OCHF ₂	C ₂ H ₅	H	CH(CH ₃) ₂
793.	OCHF ₂	OCF ₃	H	CH(CH ₃) ₂
794.	OCHF ₂	CF ₃	H	CH(CH ₃) ₂
795.	OCHF ₂	Br	H	n-C ₄ H ₉
796.	OCHF ₂	OCH ₃	H	n-C ₄ H ₉
10 797.	OCHF ₂	Cl	H	n-C ₄ H ₉
798.	OCHF ₂	F	H	n-C ₄ H ₉
799.	OCHF ₂	CH ₃	H	n-C ₄ H ₉
800.	OCHF ₂	C ₂ H ₅	H	n-C ₄ H ₉
801.	OCHF ₂	OCF ₃	H	n-C ₄ H ₉
15 802.	OCHF ₂	CF ₃	H	n-C ₄ H ₉
803.	OCHF ₂	Br	H	C(CH ₃) ₃
804.	OCHF ₂	OCH ₃	H	C(CH ₃) ₃
805.	OCHF ₂	Cl	H	C(CH ₃) ₃
806.	OCHF ₂	F	H	C(CH ₃) ₃
807.	OCHF ₂	CH ₃	H	C(CH ₃) ₃
20 808.	OCHF ₂	C ₂ H ₅	H	C(CH ₃) ₃
809.	OCHF ₂	OCF ₃	H	C(CH ₃) ₃
810.	OCHF ₂	CF ₃	H	C(CH ₃) ₃
811.	OCHF ₂	Br	H	C ₆ H ₅
812.	OCHF ₂	OCH ₃	H	C ₆ H ₅
25 813.	OCHF ₂	Cl	H	C ₆ H ₅
814.	OCHF ₂	F	H	C ₆ H ₅
815.	OCHF ₂	CH ₃	H	C ₆ H ₅
816.	OCHF ₂	C ₂ H ₅	H	C ₆ H ₅
817.	OCHF ₂	OCF ₃	H	C ₆ H ₅
818.	OCHF ₂	CF ₃	H	C ₆ H ₅
30 819.	OCHF ₂	Br	H	cyclopropyl
820.	OCHF ₂	OCH ₃	H	cyclopropyl
821.	OCHF ₂	Cl	H	cyclopropyl
822.	OCHF ₂	F	H	cyclopropyl
823.	OCHF ₂	CH ₃	H	cyclopropyl
35 824.	OCHF ₂	C ₂ H ₅	H	cyclopropyl
825.	OCHF ₂	OCF ₃	H	cyclopropyl
826.	OCHF ₂	CF ₃	H	cyclopropyl
827.	OCHF ₂	Br	H	CH ₂ -cyclopropyl
828.	OCHF ₂	OCH ₃	H	CH ₂ -cyclopropyl
829.	OCHF ₂	Cl	H	CH ₂ -cyclopropyl
40 830.	OCHF ₂	F	H	CH ₂ -cyclopropyl
831.	OCHF ₂	CH ₃	H	CH ₂ -cyclopropyl
832.	OCHF ₂	C ₂ H ₅	H	CH ₂ -cyclopropyl
833.	OCHF ₂	OCF ₃	H	CH ₂ -cyclopropyl
834.	OCHF ₂	CF ₃	H	CH ₂ -cyclopropyl
45 835.	OCHF ₂	Br	H	cyclobutyl
836.	OCHF ₂	OCH ₃	H	cyclobutyl
837.	OCHF ₂	Cl	H	cyclobutyl
838.	OCHF ₂	F	H	cyclobutyl

No.	R ^b	R ^c	R ^d	R ²
839.	OCHF ₂	CH ₃	H	cyclobutyl
840.	OCHF ₂	C ₂ H ₅	H	cyclobutyl
841.	OCHF ₂	OCF ₃	H	cyclobutyl
5 842.	OCHF ₂	CF ₃	H	cyclobutyl
843.	OCHF ₂	Br	H	cyclopentyl
844.	OCHF ₂	OCH ₃	H	cyclopentyl
845.	OCHF ₂	Cl	H	cyclopentyl
846.	OCHF ₂	F	H	cyclopentyl
847.	OCHF ₂	CH ₃	H	cyclopentyl
10 848.	OCHF ₂	C ₂ H ₅	H	cyclopentyl
849.	OCHF ₂	OCF ₃	H	cyclopentyl
850.	OCHF ₂	CF ₃	H	cyclopentyl
851.	OCHF ₂	Br	H	cyclohexyl
852.	OCHF ₂	OCH ₃	H	cyclohexyl
15 853.	OCHF ₂	Cl	H	cyclohexyl
854.	OCHF ₂	F	H	cyclohexyl
855.	OCHF ₂	CH ₃	H	cyclohexyl
856.	OCHF ₂	C ₂ H ₅	H	cyclohexyl
857.	OCHF ₂	OCF ₃	H	cyclohexyl
858.	OCHF ₂	CF ₃	H	cyclohexyl
20 859.	OCHF ₂	H	Br	H
860.	OCHF ₂	H	OCH ₃	H
861.	OCHF ₂	H	Cl	H
862.	OCHF ₂	H	F	H
863.	OCHF ₂	H	CH ₃	H
25 864.	OCHF ₂	H	C ₂ H ₅	H
865.	OCHF ₂	H	OCF ₃	H
866.	OCHF ₂	H	CF ₃	H
867.	OCHF ₂	H	Br	CH ₃
868.	OCHF ₂	H	OCH ₃	CH ₃
869.	OCHF ₂	H	Cl	CH ₃
30 870.	OCHF ₂	H	F	CH ₃
871.	OCHF ₂	H	CH ₃	CH ₃
872.	OCHF ₂	H	C ₂ H ₅	CH ₃
873.	OCHF ₂	H	OCF ₃	CH ₃
874.	OCHF ₂	H	CF ₃	CH ₃
35 875.	OCHF ₂	H	Br	C ₂ H ₅
876.	OCHF ₂	H	OCH ₃	C ₂ H ₅
877.	OCHF ₂	H	Cl	C ₂ H ₅
878.	OCHF ₂	H	F	C ₂ H ₅
879.	OCHF ₂	H	CH ₃	C ₂ H ₅
880.	OCHF ₂	H	C ₂ H ₅	C ₂ H ₅
40 881.	OCHF ₂	H	OCF ₃	C ₂ H ₅
882.	OCHF ₂	H	CF ₃	C ₂ H ₅
883.	OCHF ₂	H	Br	n-C ₃ H ₇
884.	OCHF ₂	H	OCH ₃	n-C ₃ H ₇
885.	OCHF ₂	H	Cl	n-C ₃ H ₇
45 886.	OCHF ₂	H	F	n-C ₃ H ₇
887.	OCHF ₂	H	CH ₃	n-C ₃ H ₇
888.	OCHF ₂	H	C ₂ H ₅	n-C ₃ H ₇
889.	OCHF ₂	H	OCF ₃	n-C ₃ H ₇

No.	R ^b	R ^c	R ^d	R ²
890.	OCHF ₂	H	CF ₃	n-C ₃ H ₇
891.	OCHF ₂	H	Br	CH(CH ₃) ₂
892.	OCHF ₂	H	OCH ₃	CH(CH ₃) ₂
5 893.	OCHF ₂	H	Cl	CH(CH ₃) ₂
894.	OCHF ₂	H	F	CH(CH ₃) ₂
895.	OCHF ₂	H	CH ₃	CH(CH ₃) ₂
896.	OCHF ₂	H	C ₂ H ₅	CH(CH ₃) ₂
897.	OCHF ₂	H	OCF ₃	CH(CH ₃) ₂
898.	OCHF ₂	H	CF ₃	CH(CH ₃) ₂
10 899.	OCHF ₂	H	Br	n-C ₄ H ₉
900.	OCHF ₂	H	OCH ₃	n-C ₄ H ₉
901.	OCHF ₂	H	Cl	n-C ₄ H ₉
902.	OCHF ₂	H	F	n-C ₄ H ₉
903.	OCHF ₂	H	CH ₃	n-C ₄ H ₉
15 904.	OCHF ₂	H	C ₂ H ₅	n-C ₄ H ₉
905.	OCHF ₂	H	OCF ₃	n-C ₄ H ₉
906.	OCHF ₂	H	CF ₃	n-C ₄ H ₉
907.	OCHF ₂	H	Br	C(CH ₃) ₃
908.	OCHF ₂	H	OCH ₃	C(CH ₃) ₃
909.	OCHF ₂	H	Cl	C(CH ₃) ₃
20 910.	OCHF ₂	H	F	C(CH ₃) ₃
911.	OCHF ₂	H	CH ₃	C(CH ₃) ₃
912.	OCHF ₂	H	C ₂ H ₅	C(CH ₃) ₃
913.	OCHF ₂	H	OCF ₃	C(CH ₃) ₃
914.	OCHF ₂	H	CF ₃	C(CH ₃) ₃
25 915.	OCHF ₂	H	Br	C ₆ H ₅
916.	OCHF ₂	H	OCH ₃	C ₆ H ₅
917.	OCHF ₂	H	Cl	C ₆ H ₅
918.	OCHF ₂	H	F	C ₆ H ₅
919.	OCHF ₂	H	CH ₃	C ₆ H ₅
920.	OCHF ₂	H	C ₂ H ₅	C ₆ H ₅
30 921.	OCHF ₂	H	OCF ₃	C ₆ H ₅
922.	OCHF ₂	H	CF ₃	C ₆ H ₅
923.	OCHF ₂	H	Br	cyclopropyl
924.	OCHF ₂	H	OCH ₃	cyclopropyl
925.	OCHF ₂	H	Cl	cyclopropyl
35 926.	OCHF ₂	H	F	cyclopropyl
927.	OCHF ₂	H	CH ₃	cyclopropyl
928.	OCHF ₂	H	C ₂ H ₅	cyclopropyl
929.	OCHF ₂	H	OCF ₃	cyclopropyl
930.	OCHF ₂	H	CF ₃	cyclopropyl
931.	OCHF ₂	H	Br	CH ₂ -cyclopropyl
40 932.	OCHF ₂	H	OCH ₃	CH ₂ -cyclopropyl
933.	OCHF ₂	H	Cl	CH ₂ -cyclopropyl
934.	OCHF ₂	H	F	CH ₂ -cyclopropyl
935.	OCHF ₂	H	CH ₃	CH ₂ -cyclopropyl
936.	OCHF ₂	H	C ₂ H ₅	CH ₂ -cyclopropyl
937.	OCHF ₂	H	OCF ₃	CH ₂ -cyclopropyl
45 938.	OCHF ₂	H	CF ₃	CH ₂ -cyclopropyl
939.	OCHF ₂	H	Br	cyclobutyl
940.	OCHF ₂	H	OCH ₃	cyclobutyl

No.	R ^b	R ^c	R ^d	R ²
941.	OCHF ₂	H	Cl	cyclobutyl
942.	OCHF ₂	H	F	cyclobutyl
943.	OCHF ₂	H	CH ₃	cyclobutyl
944.	OCHF ₂	H	C ₂ H ₅	cyclobutyl
945.	OCHF ₂	H	OCF ₃	cyclobutyl
946.	OCHF ₂	H	CF ₃	cyclobutyl
947.	OCHF ₂	H	Br	cyclopentyl
948.	OCHF ₂	H	OCH ₃	cyclopentyl
949.	OCHF ₂	H	Cl	cyclopentyl
950.	OCHF ₂	H	F	cyclopentyl
951.	OCHF ₂	H	CH ₃	cyclopentyl
952.	OCHF ₂	H	C ₂ H ₅	cyclopentyl
953.	OCHF ₂	H	OCF ₃	cyclopentyl
954.	OCHF ₂	H	CF ₃	cyclopentyl
955.	OCHF ₂	H	Br	cyclohexyl
956.	OCHF ₂	H	OCH ₃	cyclohexyl
957.	OCHF ₂	H	Cl	cyclohexyl
958.	OCHF ₂	H	F	cyclohexyl
959.	OCHF ₂	H	CH ₃	cyclohexyl
960.	OCHF ₂	H	C ₂ H ₅	cyclohexyl
961.	OCHF ₂	H	OCF ₃	cyclohexyl
962.	OCHF ₂	H	CF ₃	cyclohexyl
963.	OCH ₃	Br	H	H
964.	OCH ₃	OCH ₃	H	H
965.	OCH ₃	Cl	H	H
966.	OCH ₃	F	H	H
967.	OCH ₃	CH ₃	H	H
968.	OCH ₃	C ₂ H ₅	H	H
969.	OCH ₃	CF ₃	H	H
970.	OCH ₃	OCF ₃	H	H
971.	OCH ₃	OCHF ₂	H	H
972.	OCH ₃	Br	H	CH ₃
973.	OCH ₃	OCH ₃	H	CH ₃
974.	OCH ₃	Cl	H	CH ₃
975.	OCH ₃	F	H	CH ₃
976.	OCH ₃	CH ₃	H	CH ₃
977.	OCH ₃	C ₂ H ₅	H	CH ₃
978.	OCH ₃	CF ₃	H	CH ₃
979.	OCH ₃	OCF ₃	H	CH ₃
980.	OCH ₃	OCHF ₂	H	CH ₃
981.	OCH ₃	Br	H	C ₂ H ₅
982.	OCH ₃	OCH ₃	H	C ₂ H ₅
983.	OCH ₃	Cl	H	C ₂ H ₅
984.	OCH ₃	F	H	C ₂ H ₅
985.	OCH ₃	CH ₃	H	C ₂ H ₅
986.	OCH ₃	C ₂ H ₅	H	C ₂ H ₅
987.	OCH ₃	CF ₃	H	C ₂ H ₅
988.	OCH ₃	OCF ₃	H	C ₂ H ₅
989.	OCH ₃	OCHF ₂	H	C ₂ H ₅
990.	OCH ₃	Br	H	n-C ₃ H ₇
991.	OCH ₃	OCH ₃	H	n-C ₃ H ₇

No.	R ^b	R ^c	R ^d	R ²
992.	OCH ₃	Cl	H	n-C ₃ H ₇
993.	OCH ₃	F	H	n-C ₃ H ₇
994.	OCH ₃	CH ₃	H	n-C ₃ H ₇
5 995.	OCH ₃	C ₂ H ₅	H	n-C ₃ H ₇
996.	OCH ₃	CF ₃	H	n-C ₃ H ₇
997.	OCH ₃	OCF ₃	H	n-C ₃ H ₇
998.	OCH ₃	OCHF ₂	H	n-C ₃ H ₇
999.	OCH ₃	Br	H	CH(CH ₃) ₂
1000.	OCH ₃	OCH ₃	H	CH(CH ₃) ₂
10 1001.	OCH ₃	Cl	H	CH(CH ₃) ₂
1002.	OCH ₃	F	H	CH(CH ₃) ₂
1003.	OCH ₃	CH ₃	H	CH(CH ₃) ₂
1004.	OCH ₃	C ₂ H ₅	H	CH(CH ₃) ₂
1005.	OCH ₃	CF ₃	H	CH(CH ₃) ₂
15 1006.	OCH ₃	OCF ₃	H	CH(CH ₃) ₂
1007.	OCH ₃	OCHF ₂	H	CH(CH ₃) ₂
1008.	OCH ₃	Br	H	n-C ₄ H ₉
1009.	OCH ₃	OCH ₃	H	n-C ₄ H ₉
1010.	OCH ₃	Cl	H	n-C ₄ H ₉
20 1011.	OCH ₃	F	H	n-C ₄ H ₉
1012.	OCH ₃	CH ₃	H	n-C ₄ H ₉
1013.	OCH ₃	C ₂ H ₅	H	n-C ₄ H ₉
1014.	OCH ₃	CF ₃	H	n-C ₄ H ₉
1015.	OCH ₃	OCF ₃	H	n-C ₄ H ₉
1016.	OCH ₃	OCHF ₂	H	n-C ₄ H ₉
25 1017.	OCH ₃	Br	H	C(CH ₃) ₃
1018.	OCH ₃	OCH ₃	H	C(CH ₃) ₃
1019.	OCH ₃	Cl	H	C(CH ₃) ₃
1020.	OCH ₃	F	H	C(CH ₃) ₃
1021.	OCH ₃	CH ₃	H	C(CH ₃) ₃
1022.	OCH ₃	C ₂ H ₅	H	C(CH ₃) ₃
30 1023.	OCH ₃	CF ₃	H	C(CH ₃) ₃
1024.	OCH ₃	OCF ₃	H	C(CH ₃) ₃
1025.	OCH ₃	OCHF ₂	H	C(CH ₃) ₃
1026.	OCH ₃	Br	H	C ₆ H ₅
1027.	OCH ₃	OCH ₃	H	C ₆ H ₅
35 1028.	OCH ₃	Cl	H	C ₆ H ₅
1029.	OCH ₃	F	H	C ₆ H ₅
1030.	OCH ₃	CH ₃	H	C ₆ H ₅
1031.	OCH ₃	C ₂ H ₅	H	C ₆ H ₅
1032.	OCH ₃	CF ₃	H	C ₆ H ₅
1033.	OCH ₃	OCF ₃	H	C ₆ H ₅
40 1034.	OCH ₃	OCHF ₂	H	C ₆ H ₅
1035.	OCH ₃	Br	H	cyclopropyl
1036.	OCH ₃	OCH ₃	H	cyclopropyl
1037.	OCH ₃	Cl	H	cyclopropyl
1038.	OCH ₃	F	H	cyclopropyl
45 1039.	OCH ₃	CH ₃	H	cyclopropyl
1040.	OCH ₃	C ₂ H ₅	H	cyclopropyl
1041.	OCH ₃	CF ₃	H	cyclopropyl
1042.	OCH ₃	OCF ₃	H	cyclopropyl

No.	R ^b	R ^c	R ^d	R ²
1043.	OCH ₃	OCHF ₂	H	cyclopropyl
1044.	OCH ₃	Br	H	CH ₂ -cyclopropyl
1045.	OCH ₃	OCH ₃	H	CH ₂ -cyclopropyl
5 1046.	OCH ₃	Cl	H	CH ₂ -cyclopropyl
1047.	OCH ₃	F	H	CH ₂ -cyclopropyl
1048.	OCH ₃	CH ₃	H	CH ₂ -cyclopropyl
1049.	OCH ₃	C ₂ H ₅	H	CH ₂ -cyclopropyl
1050.	OCH ₃	CF ₃	H	CH ₂ -cyclopropyl
1051.	OCH ₃	OCF ₃	H	CH ₂ -cyclopropyl
10 1052.	OCH ₃	OCHF ₂	H	CH ₂ -cyclopropyl
1053.	OCH ₃	Br	H	cyclobutyl
1054.	OCH ₃	OCH ₃	H	cyclobutyl
1055.	OCH ₃	Cl	H	cyclobutyl
1056.	OCH ₃	F	H	cyclobutyl
15 1057.	OCH ₃	CH ₃	H	cyclobutyl
1058.	OCH ₃	C ₂ H ₅	H	cyclobutyl
1059.	OCH ₃	CF ₃	H	cyclobutyl
1060.	OCH ₃	OCF ₃	H	cyclobutyl
1061.	OCH ₃	OCHF ₂	H	cyclobutyl
1062.	OCH ₃	Br	H	cyclopentyl
20 1063.	OCH ₃	OCH ₃	H	cyclopentyl
1064.	OCH ₃	Cl	H	cyclopentyl
1065.	OCH ₃	F	H	cyclopentyl
1066.	OCH ₃	CH ₃	H	cyclopentyl
1067.	OCH ₃	C ₂ H ₅	H	cyclopentyl
25 1068.	OCH ₃	CF ₃	H	cyclopentyl
1069.	OCH ₃	OCF ₃	H	cyclopentyl
1070.	OCH ₃	OCHF ₂	H	cyclopentyl
1071.	OCH ₃	Br	H	cyclohexyl
1072.	OCH ₃	OCH ₃	H	cyclohexyl
1073.	OCH ₃	Cl	H	cyclohexyl
30 1074.	OCH ₃	F	H	cyclohexyl
1075.	OCH ₃	CH ₃	H	cyclohexyl
1076.	OCH ₃	C ₂ H ₅	H	cyclohexyl
1077.	OCH ₃	CF ₃	H	cyclohexyl
1078.	OCH ₃	OCF ₃	H	cyclohexyl
1079.	OCH ₃	OCHF ₂	H	cyclohexyl
35 1080.	OCH ₃	H	Br	H
1081.	OCH ₃	H	OCH ₃	H
1082.	OCH ₃	H	Cl	H
1083.	OCH ₃	H	F	H
1084.	OCH ₃	H	CH ₃	H
40 1085.	OCH ₃	H	C ₂ H ₅	H
1086.	OCH ₃	H	CF ₃	H
1087.	OCH ₃	H	OCF ₃	H
1088.	OCH ₃	H	OCHF ₂	H
1089.	OCH ₃	H	Br	CH ₃
45 1090.	OCH ₃	H	OCH ₃	CH ₃
1091.	OCH ₃	H	Cl	CH ₃
1092.	OCH ₃	H	F	CH ₃
1093.	OCH ₃	H	CH ₃	CH ₃

No.	R ^b	R ^c	R ^d	R ²
1094.	OCH ₃	H	C ₂ H ₅	CH ₃
1095.	OCH ₃	H	CF ₃	CH ₃
1096.	OCH ₃	H	OCF ₃	CH ₃
5 1097.	OCH ₃	H	OCHF ₂	CH ₃
1098.	OCH ₃	H	Br	C ₂ H ₅
1099.	OCH ₃	H	OCH ₃	C ₂ H ₅
1100.	OCH ₃	H	Cl	C ₂ H ₅
1101.	OCH ₃	H	F	C ₂ H ₅
1102.	OCH ₃	H	CH ₃	C ₂ H ₅
10 1103.	OCH ₃	H	C ₂ H ₅	C ₂ H ₅
1104.	OCH ₃	H	CF ₃	C ₂ H ₅
1105.	OCH ₃	H	OCF ₃	C ₂ H ₅
1106.	OCH ₃	H	OCHF ₂	C ₂ H ₅
1107.	OCH ₃	H	Br	n-C ₃ H ₇
15 1108.	OCH ₃	H	OCH ₃	n-C ₃ H ₇
1109.	OCH ₃	H	Cl	n-C ₃ H ₇
1110.	OCH ₃	H	F	n-C ₃ H ₇
1111.	OCH ₃	H	CH ₃	n-C ₃ H ₇
1112.	OCH ₃	H	C ₂ H ₅	n-C ₃ H ₇
1113.	OCH ₃	H	CF ₃	n-C ₃ H ₇
20 1114.	OCH ₃	H	OCF ₃	n-C ₃ H ₇
1115.	OCH ₃	H	OCHF ₂	n-C ₃ H ₇
1116.	OCH ₃	H	Br	CH(CH ₃) ₂
1117.	OCH ₃	H	OCH ₃	CH(CH ₃) ₂
1118.	OCH ₃	H	Cl	CH(CH ₃) ₂
25 1119.	OCH ₃	H	F	CH(CH ₃) ₂
1120.	OCH ₃	H	CH ₃	CH(CH ₃) ₂
1121.	OCH ₃	H	C ₂ H ₅	CH(CH ₃) ₂
1122.	OCH ₃	H	CF ₃	CH(CH ₃) ₂
1123.	OCH ₃	H	OCF ₃	CH(CH ₃) ₂
1124.	OCH ₃	H	OCHF ₂	CH(CH ₃) ₂
30 1125.	OCH ₃	H	Br	n-C ₄ H ₉
1126.	OCH ₃	H	OCH ₃	n-C ₄ H ₉
1127.	OCH ₃	H	Cl	n-C ₄ H ₉
1128.	OCH ₃	H	F	n-C ₄ H ₉
1129.	OCH ₃	H	CH ₃	n-C ₄ H ₉
35 1130.	OCH ₃	H	C ₂ H ₅	n-C ₄ H ₉
1131.	OCH ₃	H	CF ₃	n-C ₄ H ₉
1132.	OCH ₃	H	OCF ₃	n-C ₄ H ₉
1133.	OCH ₃	H	OCHF ₂	n-C ₄ H ₉
1134.	OCH ₃	H	Br	C(CH ₃) ₃
1135.	OCH ₃	H	OCH ₃	C(CH ₃) ₃
40 1136.	OCH ₃	H	Cl	C(CH ₃) ₃
1137.	OCH ₃	H	F	C(CH ₃) ₃
1138.	OCH ₃	H	CH ₃	C(CH ₃) ₃
1139.	OCH ₃	H	C ₂ H ₅	C(CH ₃) ₃
1140.	OCH ₃	H	CF ₃	C(CH ₃) ₃
45 1141.	OCH ₃	H	OCF ₃	C(CH ₃) ₃
1142.	OCH ₃	H	OCHF ₂	C(CH ₃) ₃
1143.	OCH ₃	H	Br	C ₆ H ₅
1144.	OCH ₃	H	OCH ₃	C ₆ H ₅

No.	R ^b	R ^c	R ^d	R ²
1145.	OCH ₃	H	Cl	C ₆ H ₅
1146.	OCH ₃	H	F	C ₆ H ₅
1147.	OCH ₃	H	CH ₃	C ₆ H ₅
1148.	OCH ₃	H	C ₂ H ₅	C ₆ H ₅
1149.	OCH ₃	H	CF ₃	C ₆ H ₅
1150.	OCH ₃	H	OCF ₃	C ₆ H ₅
1151.	OCH ₃	H	OCHF ₂	C ₆ H ₅
1152.	OCH ₃	H	Br	cyclopropyl
1153.	OCH ₃	H	OCH ₃	cyclopropyl
1154.	OCH ₃	H	Cl	cyclopropyl
1155.	OCH ₃	H	F	cyclopropyl
1156.	OCH ₃	H	CH ₃	cyclopropyl
1157.	OCH ₃	H	C ₂ H ₅	cyclopropyl
1158.	OCH ₃	H	CF ₃	cyclopropyl
1159.	OCH ₃	H	OCF ₃	cyclopropyl
1160.	OCH ₃	H	OCHF ₂	cyclopropyl
1161.	OCH ₃	H	Br	CH ₂ -cyclopropyl
1162.	OCH ₃	H	OCH ₃	CH ₂ -cyclopropyl
1163.	OCH ₃	H	Cl	CH ₂ -cyclopropyl
1164.	OCH ₃	H	F	CH ₂ -cyclopropyl
1165.	OCH ₃	H	CH ₃	CH ₂ -cyclopropyl
1166.	OCH ₃	H	C ₂ H ₅	CH ₂ -cyclopropyl
1167.	OCH ₃	H	CF ₃	CH ₂ -cyclopropyl
1168.	OCH ₃	H	OCF ₃	CH ₂ -cyclopropyl
1169.	OCH ₃	H	OCHF ₂	CH ₂ -cyclopropyl
1170.	OCH ₃	H	Br	cyclobutyl
1171.	OCH ₃	H	OCH ₃	cyclobutyl
1172.	OCH ₃	H	Cl	cyclobutyl
1173.	OCH ₃	H	F	cyclobutyl
1174.	OCH ₃	H	CH ₃	cyclobutyl
1175.	OCH ₃	H	C ₂ H ₅	cyclobutyl
1176.	OCH ₃	H	CF ₃	cyclobutyl
1177.	OCH ₃	H	OCF ₃	cyclobutyl
1178.	OCH ₃	H	OCHF ₂	cyclobutyl
1179.	OCH ₃	H	Br	cyclopentyl
1180.	OCH ₃	H	OCH ₃	cyclopentyl
1181.	OCH ₃	H	Cl	cyclopentyl
1182.	OCH ₃	H	F	cyclopentyl
1183.	OCH ₃	H	CH ₃	cyclopentyl
1184.	OCH ₃	H	C ₂ H ₅	cyclopentyl
1185.	OCH ₃	H	CF ₃	cyclopentyl
1186.	OCH ₃	H	OCF ₃	cyclopentyl
1187.	OCH ₃	H	OCHF ₂	cyclopentyl
1188.	OCH ₃	H	Br	cyclohexyl
1189.	OCH ₃	H	OCH ₃	cyclohexyl
1190.	OCH ₃	H	Cl	cyclohexyl
1191.	OCH ₃	H	F	cyclohexyl
1192.	OCH ₃	H	CH ₃	cyclohexyl
1193.	OCH ₃	H	C ₂ H ₅	cyclohexyl
1194.	OCH ₃	H	CF ₃	cyclohexyl

	No.	R ^b	R ^c	R ^d	R ²
	1195.	OCH ₃	H	OCF ₃	cyclohexyl
	1196.	OCH ₃	H	OCHF ₂	cyclohexyl
5	1197.	Cl	Cl	H	H
	1198.	Cl	F	H	H
	1199.	Cl	CH ₃	H	H
	1200.	Cl	OCH ₃	H	H
	1201.	Cl	Br	H	H
10	1202.	Cl	CF ₃	H	H
	1203.	Cl	OCF ₃	H	H
	1204.	Cl	Cl	H	CH ₃
	1205.	Cl	F	H	CH ₃
	1206.	Cl	CH ₃	H	CH ₃
15	1207.	Cl	OCH ₃	H	CH ₃
	1208.	Cl	Br	H	CH ₃
	1209.	Cl	CF ₃	H	CH ₃
	1210.	Cl	OCF ₃	H	CH ₃
	1211.	Cl	Cl	H	C ₂ H ₅
20	1212.	Cl	F	H	C ₂ H ₅
	1213.	Cl	CH ₃	H	C ₂ H ₅
	1214.	Cl	OCH ₃	H	C ₂ H ₅
	1215.	Cl	Br	H	C ₂ H ₅
	1216.	Cl	CF ₃	H	C ₂ H ₅
25	1217.	Cl	OCF ₃	H	C ₂ H ₅
	1218.	Cl	Cl	H	n-C ₃ H ₇
	1219.	Cl	F	H	n-C ₃ H ₇
	1220.	Cl	CH ₃	H	n-C ₃ H ₇
	1221.	Cl	OCH ₃	H	n-C ₃ H ₇
30	1222.	Cl	Br	H	n-C ₃ H ₇
	1223.	Cl	CF ₃	H	n-C ₃ H ₇
	1224.	Cl	OCF ₃	H	n-C ₃ H ₇
	1225.	Cl	Cl	H	CH(CH ₃) ₂
	1226.	Cl	F	H	CH(CH ₃) ₂
35	1227.	Cl	CH ₃	H	CH(CH ₃) ₂
	1228.	Cl	OCH ₃	H	CH(CH ₃) ₂
	1229.	Cl	Br	H	CH(CH ₃) ₂
	1230.	Cl	CF ₃	H	CH(CH ₃) ₂
	1231.	Cl	OCF ₃	H	CH(CH ₃) ₂
40	1232.	Cl	Cl	H	n-C ₄ H ₉
	1233.	Cl	F	H	n-C ₄ H ₉
	1234.	Cl	CH ₃	H	n-C ₄ H ₉
	1235.	Cl	OCH ₃	H	n-C ₄ H ₉
	1236.	Cl	Br	H	n-C ₄ H ₉
45	1237.	Cl	CF ₃	H	n-C ₄ H ₉
	1238.	Cl	OCF ₃	H	n-C ₄ H ₉
	1239.	Cl	Cl	H	C(CH ₃) ₃
	1240.	Cl	F	H	C(CH ₃) ₃
	1241.	Cl	CH ₃	H	C(CH ₃) ₃
	1242.	Cl	OCH ₃	H	C(CH ₃) ₃
	1243.	Cl	Br	H	C(CH ₃) ₃
	1244.	Cl	CF ₃	H	C(CH ₃) ₃
	1245.	Cl	OCF ₃	H	C(CH ₃) ₃

	No.	R ^b	R ^c	R ^d	R ²
	1246.	Cl	Cl	H	C ₆ H ₅
	1247.	Cl	F	H	C ₆ H ₅
	1248.	Cl	CH ₃	H	C ₆ H ₅
5	1249.	Cl	OCH ₃	H	C ₆ H ₅
	1250.	Cl	Br	H	C ₆ H ₅
	1251.	Cl	CF ₃	H	C ₆ H ₅
	1252.	Cl	OCF ₃	H	C ₆ H ₅
	1253.	Cl	Cl	H	cyclopropyl
10	1254.	Cl	F	H	cyclopropyl
	1255.	Cl	CH ₃	H	cyclopropyl
	1256.	Cl	OCH ₃	H	cyclopropyl
	1257.	Cl	Br	H	cyclopropyl
	1258.	Cl	CF ₃	H	cyclopropyl
	1259.	Cl	OCF ₃	H	cyclopropyl
15	1260.	Cl	Cl	H	CH ₂ -cyclopropyl
	1261.	Cl	F	H	CH ₂ -cyclopropyl
	1262.	Cl	CH ₃	H	CH ₂ -cyclopropyl
	1263.	Cl	OCH ₃	H	CH ₂ -cyclopropyl
	1264.	Cl	Br	H	CH ₂ -cyclopropyl
	1265.	Cl	CF ₃	H	CH ₂ -cyclopropyl
20	1266.	Cl	OCF ₃	H	CH ₂ -cyclopropyl
	1267.	Cl	Cl	H	cyclobutyl
	1268.	Cl	F	H	cyclobutyl
	1269.	Cl	CH ₃	H	cyclobutyl
	1270.	Cl	OCH ₃	H	cyclobutyl
25	1271.	Cl	Br	H	cyclobutyl
	1272.	Cl	CF ₃	H	cyclobutyl
	1273.	Cl	OCF ₃	H	cyclobutyl
	1274.	Cl	Cl	H	cyclopentyl
	1275.	Cl	F	H	cyclopentyl
	1276.	Cl	CH ₃	H	cyclopentyl
30	1277.	Cl	OCH ₃	H	cyclopentyl
	1278.	Cl	Br	H	cyclopentyl
	1279.	Cl	CF ₃	H	cyclopentyl
	1280.	Cl	OCF ₃	H	cyclopentyl
	1281.	Cl	Cl	H	cyclohexyl
35	1282.	Cl	F	H	cyclohexyl
	1283.	Cl	CH ₃	H	cyclohexyl
	1284.	Cl	OCH ₃	H	cyclohexyl
	1285.	Cl	Br	H	cyclohexyl
	1286.	Cl	CF ₃	H	cyclohexyl
	1287.	Cl	OCF ₃	H	cyclohexyl
40	1288.	Cl	H	Cl	H
	1289.	Cl	H	F	H
	1290.	Cl	H	CH ₃	H
	1291.	Cl	H	OCH ₃	H
	1292.	Cl	H	Br	H
45	1293.	Cl	H	CF ₃	H
	1294.	Cl	H	OCF ₃	H
	1295.	Cl	H	Cl	CH ₃
	1296.	Cl	H	F	CH ₃

	No.	R ^b	R ^c	R ^d	R ²
	1297.	Cl	H	CH ₃	CH ₃
	1298.	Cl	H	OCH ₃	CH ₃
	1299.	Cl	H	Br	CH ₃
5	1300.	Cl	H	CF ₃	CH ₃
	1301.	Cl	H	OCF ₃	CH ₃
	1302.	Cl	H	Cl	C ₂ H ₅
	1303.	Cl	H	F	C ₂ H ₅
	1304.	Cl	H	CH ₃	C ₂ H ₅
	1305.	Cl	H	OCH ₃	C ₂ H ₅
10	1306.	Cl	H	Br	C ₂ H ₅
	1307.	Cl	H	CF ₃	C ₂ H ₅
	1308.	Cl	H	OCF ₃	C ₂ H ₅
	1309.	Cl	H	Cl	n-C ₃ H ₇
	1310.	Cl	H	F	n-C ₃ H ₇
15	1311.	Cl	H	CH ₃	n-C ₃ H ₇
	1312.	Cl	H	OCH ₃	n-C ₃ H ₇
	1313.	Cl	H	Br	n-C ₃ H ₇
	1314.	Cl	H	CF ₃	n-C ₃ H ₇
	1315.	Cl	H	OCF ₃	n-C ₃ H ₇
	1316.	Cl	H	Cl	CH(CH ₃) ₂
20	1317.	Cl	H	F	CH(CH ₃) ₂
	1318.	Cl	H	CH ₃	CH(CH ₃) ₂
	1319.	Cl	H	OCH ₃	CH(CH ₃) ₂
	1320.	Cl	H	Br	CH(CH ₃) ₂
	1321.	Cl	H	CF ₃	CH(CH ₃) ₂
25	1322.	Cl	H	OCF ₃	CH(CH ₃) ₂
	1323.	Cl	H	Cl	n-C ₄ H ₉
	1324.	Cl	H	F	n-C ₄ H ₉
	1325.	Cl	H	CH ₃	n-C ₄ H ₉
	1326.	Cl	H	OCH ₃	n-C ₄ H ₉
	1327.	Cl	H	Br	n-C ₄ H ₉
30	1328.	Cl	H	CF ₃	n-C ₄ H ₉
	1329.	Cl	H	OCF ₃	n-C ₄ H ₉
	1330.	Cl	H	Cl	C(CH ₃) ₃
	1331.	Cl	H	F	C(CH ₃) ₃
	1332.	Cl	H	CH ₃	C(CH ₃) ₃
35	1333.	Cl	H	OCH ₃	C(CH ₃) ₃
	1334.	Cl	H	Br	C(CH ₃) ₃
	1335.	Cl	H	CF ₃	C(CH ₃) ₃
	1336.	Cl	H	OCF ₃	C(CH ₃) ₃
	1337.	Cl	H	Cl	C ₆ H ₅
	1338.	Cl	H	F	C ₆ H ₅
40	1339.	Cl	H	CH ₃	C ₆ H ₅
	1340.	Cl	H	OCH ₃	C ₆ H ₅
	1341.	Cl	H	Br	C ₆ H ₅
	1342.	Cl	H	CF ₃	C ₆ H ₅
	1343.	Cl	H	OCF ₃	C ₆ H ₅
45	1344.	Cl	H	Cl	cyclopropyl
	1345.	Cl	H	F	cyclopropyl
	1346.	Cl	H	CH ₃	cyclopropyl
	1347.	Cl	H	OCH ₃	cyclopropyl

No.	R ^b	R ^c	R ^d	R ²
1348.	Cl	H	Br	cyclopropyl
1349.	Cl	H	CF ₃	cyclopropyl
1350.	Cl	H	OCF ₃	cyclopropyl
5 1351.	Cl	H	Cl	CH ₂ -cyclopropyl
1352.	Cl	H	F	CH ₂ -cyclopropyl
1353.	Cl	H	CH ₃	CH ₂ -cyclopropyl
1354.	Cl	H	OCH ₃	CH ₂ -cyclopropyl
1355.	Cl	H	Br	CH ₂ -cyclopropyl
1356.	Cl	H	CF ₃	CH ₂ -cyclopropyl
10 1357.	Cl	H	OCF ₃	CH ₂ -cyclopropyl
1358.	Cl	H	Cl	cyclobutyl
1359.	Cl	H	F	cyclobutyl
1360.	Cl	H	CH ₃	cyclobutyl
1361.	Cl	H	OCH ₃	cyclobutyl
15 1362.	Cl	H	Br	cyclobutyl
1363.	Cl	H	CF ₃	cyclobutyl
1364.	Cl	H	OCF ₃	cyclobutyl
1365.	Cl	H	Cl	cyclopentyl
1366.	Cl	H	F	cyclopentyl
1367.	Cl	H	CH ₃	cyclopentyl
20 1368.	Cl	H	OCH ₃	cyclopentyl
1369.	Cl	H	Br	cyclopentyl
1370.	Cl	H	CF ₃	cyclopentyl
1371.	Cl	H	OCF ₃	cyclopentyl
1372.	Cl	H	Cl	cyclohexyl
25 1373.	Cl	H	F	cyclohexyl
1374.	Cl	H	CH ₃	cyclohexyl
1375.	Cl	H	OCH ₃	cyclohexyl
1376.	Cl	H	Br	cyclohexyl
1377.	Cl	H	CF ₃	cyclohexyl
1378.	Cl	H	OCF ₃	cyclohexyl
30 1379.	Br	Cl	H	H
1380.	Br	F	H	H
1381.	Br	CH ₃	H	H
1382.	Br	OCH ₃	H	H
1383.	Br	Br	H	H
35 1384.	Br	CF ₃	H	H
1385.	Br	OCF ₃	H	H
1386.	Br	Cl	H	CH ₃
1387.	Br	F	H	CH ₃
1388.	Br	CH ₃	H	CH ₃
1389.	Br	OCH ₃	H	CH ₃
40 1390.	Br	Br	H	CH ₃
1391.	Br	CF ₃	H	CH ₃
1392.	Br	OCF ₃	H	CH ₃
1393.	Br	Cl	H	C ₂ H ₅
1394.	Br	F	H	C ₂ H ₅
45 1395.	Br	CH ₃	H	C ₂ H ₅
1396.	Br	OCH ₃	H	C ₂ H ₅
1397.	Br	Br	H	C ₂ H ₅
1398.	Br	CF ₃	H	C ₂ H ₅

No.	R ^b	R ^c	R ^d	R ²
1399.	Br	OCF ₃	H	C ₂ H ₅
1400.	Br	Cl	H	n-C ₃ H ₇
1401.	Br	F	H	n-C ₃ H ₇
5 1402.	Br	CH ₃	H	n-C ₃ H ₇
1403.	Br	OCH ₃	H	n-C ₃ H ₇
1404.	Br	Br	H	n-C ₃ H ₇
1405.	Br	CF ₃	H	n-C ₃ H ₇
1406.	Br	OCF ₃	H	n-C ₃ H ₇
10 1407.	Br	Cl	H	CH(CH ₃) ₂
1408.	Br	F	H	CH(CH ₃) ₂
1409.	Br	CH ₃	H	CH(CH ₃) ₂
1410.	Br	OCH ₃	H	CH(CH ₃) ₂
1411.	Br	Br	H	CH(CH ₃) ₂
1412.	Br	CF ₃	H	CH(CH ₃) ₂
15 1413.	Br	OCF ₃	H	CH(CH ₃) ₂
1414.	Br	Cl	H	n-C ₄ H ₉
1415.	Br	F	H	n-C ₄ H ₉
1416.	Br	CH ₃	H	n-C ₄ H ₉
1417.	Br	OCH ₃	H	n-C ₄ H ₉
20 1418.	Br	Br	H	n-C ₄ H ₉
1419.	Br	CF ₃	H	n-C ₄ H ₉
1420.	Br	OCF ₃	H	n-C ₄ H ₉
1421.	Br	Cl	H	C(CH ₃) ₃
1422.	Br	F	H	C(CH ₃) ₃
1423.	Br	CH ₃	H	C(CH ₃) ₃
25 1424.	Br	OCH ₃	H	C(CH ₃) ₃
1425.	Br	Br	H	C(CH ₃) ₃
1426.	Br	CF ₃	H	C(CH ₃) ₃
1427.	Br	OCF ₃	H	C(CH ₃) ₃
1428.	Br	Cl	H	C ₆ H ₅
1429.	Br	F	H	C ₆ H ₅
30 1430.	Br	CH ₃	H	C ₆ H ₅
1431.	Br	OCH ₃	H	C ₆ H ₅
1432.	Br	Br	H	C ₆ H ₅
1433.	Br	CF ₃	H	C ₆ H ₅
1434.	Br	OCF ₃	H	C ₆ H ₅
35 1435.	Br	Cl	H	cyclopropyl
1436.	Br	F	H	cyclopropyl
1437.	Br	CH ₃	H	cyclopropyl
1438.	Br	OCH ₃	H	cyclopropyl
1439.	Br	Br	H	cyclopropyl
1440.	Br	CF ₃	H	cyclopropyl
40 1441.	Br	OCF ₃	H	cyclopropyl
1442.	Br	Cl	H	CH ₂ -cyclopropyl
1443.	Br	F	H	CH ₂ -cyclopropyl
1444.	Br	CH ₃	H	CH ₂ -cyclopropyl
1445.	Br	OCH ₃	H	CH ₂ -cyclopropyl
45 1446.	Br	Br	H	CH ₂ -cyclopropyl
1447.	Br	CF ₃	H	CH ₂ -cyclopropyl
1448.	Br	OCF ₃	H	CH ₂ -cyclopropyl
1449.	Br	Cl	H	cyclobutyl

	No.	R ^b	R ^c	R ^d	R ²
5	1450.	Br	F	H	cyclobutyl
	1451.	Br	CH ₃	H	cyclobutyl
	1452.	Br	OCH ₃	H	cyclobutyl
	1453.	Br	Br	H	cyclobutyl
	1454.	Br	CF ₃	H	cyclobutyl
10	1455.	Br	OCF ₃	H	cyclobutyl
	1456.	Br	Cl	H	cyclopentyl
	1457.	Br	F	H	cyclopentyl
	1458.	Br	CH ₃	H	cyclopentyl
	1459.	Br	OCH ₃	H	cyclopentyl
15	1460.	Br	Br	H	cyclopentyl
	1461.	Br	CF ₃	H	cyclopentyl
	1462.	Br	OCF ₃	H	cyclopentyl
	1463.	Br	Cl	H	cyclohexyl
	1464.	Br	F	H	cyclohexyl
20	1465.	Br	CH ₃	H	cyclohexyl
	1466.	Br	OCH ₃	H	cyclohexyl
	1467.	Br	Br	H	cyclohexyl
	1468.	Br	CF ₃	H	cyclohexyl
	1469.	Br	OCF ₃	H	cyclohexyl
25	1470.	Br	H	Cl	H
	1471.	Br	H	F	H
	1472.	Br	H	CH ₃	H
	1473.	Br	H	OCH ₃	H
	1474.	Br	H	Br	H
30	1475.	Br	H	CF ₃	H
	1476.	Br	H	OCF ₃	H
	1477.	Br	H	Cl	CH ₃
	1478.	Br	H	F	CH ₃
	1479.	Br	H	CH ₃	CH ₃
35	1480.	Br	H	OCH ₃	CH ₃
	1481.	Br	H	Br	CH ₃
	1482.	Br	H	CF ₃	CH ₃
	1483.	Br	H	OCF ₃	CH ₃
	1484.	Br	H	Cl	C ₂ H ₅
40	1485.	Br	H	F	C ₂ H ₅
	1486.	Br	H	CH ₃	C ₂ H ₅
	1487.	Br	H	OCH ₃	C ₂ H ₅
	1488.	Br	H	Br	C ₂ H ₅
	1489.	Br	H	CF ₃	C ₂ H ₅
45	1490.	Br	H	OCF ₃	C ₂ H ₅
	1491.	Br	H	Cl	n-C ₃ H ₇
	1492.	Br	H	F	n-C ₃ H ₇
	1493.	Br	H	CH ₃	n-C ₃ H ₇
	1494.	Br	H	OCH ₃	n-C ₃ H ₇
45	1495.	Br	H	Br	n-C ₃ H ₇
	1496.	Br	H	CF ₃	n-C ₃ H ₇
	1497.	Br	H	OCF ₃	n-C ₃ H ₇
	1498.	Br	H	Cl	CH(CH ₃) ₂
	1499.	Br	H	F	CH(CH ₃) ₂
	1500.	Br	H	CH ₃	CH(CH ₃) ₂

No.	R ^b	R ^c	R ^d	R ²
1501.	Br	H	OCH ₃	CH(CH ₃) ₂
1502.	Br	H	Br	CH(CH ₃) ₂
1503.	Br	H	CF ₃	CH(CH ₃) ₂
5 1504.	Br	H	OCF ₃	CH(CH ₃) ₂
1505.	Br	H	Cl	n-C ₄ H ₉
1506.	Br	H	F	n-C ₄ H ₉
1507.	Br	H	CH ₃	n-C ₄ H ₉
1508.	Br	H	OCH ₃	n-C ₄ H ₉
1509.	Br	H	Br	n-C ₄ H ₉
10 1510.	Br	H	CF ₃	n-C ₄ H ₉
1511.	Br	H	OCF ₃	n-C ₄ H ₉
1512.	Br	H	Cl	C(CH ₃) ₃
1513.	Br	H	F	C(CH ₃) ₃
1514.	Br	H	CH ₃	C(CH ₃) ₃
15 1515.	Br	H	OCH ₃	C(CH ₃) ₃
1516.	Br	H	Br	C(CH ₃) ₃
1517.	Br	H	CF ₃	C(CH ₃) ₃
1518.	Br	H	OCF ₃	C(CH ₃) ₃
1519.	Br	H	Cl	C ₆ H ₅
20 1520.	Br	H	F	C ₆ H ₅
1521.	Br	H	CH ₃	C ₆ H ₅
1522.	Br	H	OCH ₃	C ₆ H ₅
1523.	Br	H	Br	C ₆ H ₅
1524.	Br	H	CF ₃	C ₆ H ₅
1525.	Br	H	OCF ₃	C ₆ H ₅
25 1526.	Br	H	Cl	cyclopropyl
1527.	Br	H	F	cyclopropyl
1528.	Br	H	CH ₃	cyclopropyl
1529.	Br	H	OCH ₃	cyclopropyl
1530.	Br	H	Br	cyclopropyl
30 1531.	Br	H	CF ₃	cyclopropyl
1532.	Br	H	OCF ₃	cyclopropyl
1533.	Br	H	Cl	CH ₂ -cyclopropyl
1534.	Br	H	F	CH ₂ -cyclopropyl
1535.	Br	H	CH ₃	CH ₂ -cyclopropyl
1536.	Br	H	OCH ₃	CH ₂ -cyclopropyl
35 1537.	Br	H	Br	CH ₂ -cyclopropyl
1538.	Br	H	CF ₃	CH ₂ -cyclopropyl
1539.	Br	H	OCF ₃	CH ₂ -cyclopropyl
1540.	Br	H	Cl	cyclobutyl
1541.	Br	H	F	cyclobutyl
1542.	Br	H	CH ₃	cyclobutyl
40 1543.	Br	H	OCH ₃	cyclobutyl
1544.	Br	H	Br	cyclobutyl
1545.	Br	H	CF ₃	cyclobutyl
1546.	Br	H	OCF ₃	cyclobutyl
1547.	Br	H	Cl	cyclopentyl
45 1548.	Br	H	F	cyclopentyl
1549.	Br	H	CH ₃	cyclopentyl
1550.	Br	H	OCH ₃	cyclopentyl
1551.	Br	H	Br	cyclopentyl

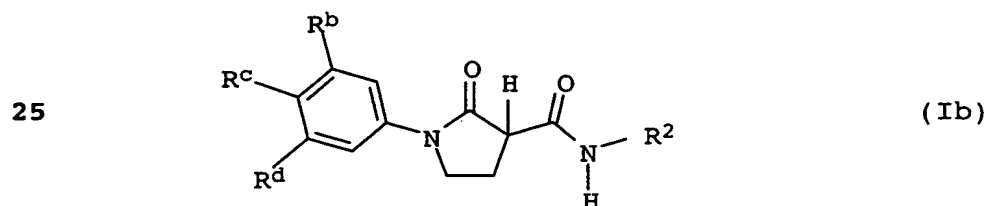
	No.	R ^b	R ^c	R ^d	R ²
5	1552.	Br	H	CF ₃	cyclopentyl
	1553.	Br	H	OCF ₃	cyclopentyl
	1554.	Br	H	Cl	cyclohexyl
	1555.	Br	H	F	cyclohexyl
	1556.	Br	H	CH ₃	cyclohexyl
10	1557.	Br	H	OCH ₃	cyclohexyl
	1558.	Br	H	Br	cyclohexyl
	1559.	Br	H	CF ₃	cyclohexyl
	1560.	Br	H	OCF ₃	cyclohexyl
	1561.	CH ₃	Cl	H	H
15	1562.	CH ₃	F	H	H
	1563.	CH ₃	CH ₃	H	H
	1564.	CH ₃	OCH ₃	H	H
	1565.	CH ₃	Br	H	H
	1566.	CH ₃	CF ₃	H	H
20	1567.	CH ₃	OCF ₃	H	H
	1568.	CH ₃	Cl	H	CH ₃
	1569.	CH ₃	F	H	CH ₃
	1570.	CH ₃	CH ₃	H	CH ₃
	1571.	CH ₃	Br	H	CH ₃
25	1572.	CH ₃	CF ₃	H	CH ₃
	1573.	CH ₃	OCF ₃	H	CH ₃
	1574.	CH ₃	Cl	H	C ₂ H ₅
	1575.	CH ₃	F	H	C ₂ H ₅
	1576.	CH ₃	CH ₃	H	C ₂ H ₅
30	1577.	CH ₃	Br	H	C ₂ H ₅
	1578.	CH ₃	CF ₃	H	C ₂ H ₅
	1579.	CH ₃	OCF ₃	H	C ₂ H ₅
	1580.	CH ₃	Cl	H	n-C ₃ H ₇
	1581.	CH ₃	F	H	n-C ₃ H ₇
35	1582.	CH ₃	CH ₃	H	n-C ₃ H ₇
	1583.	CH ₃	Br	H	n-C ₃ H ₇
	1584.	CH ₃	CF ₃	H	n-C ₃ H ₇
	1585.	CH ₃	OCF ₃	H	n-C ₃ H ₇
	1586.	CH ₃	Cl	H	CH(CH ₃) ₂
40	1587.	CH ₃	F	H	CH(CH ₃) ₂
	1588.	CH ₃	CH ₃	H	CH(CH ₃) ₂
	1589.	CH ₃	Br	H	CH(CH ₃) ₂
	1590.	CH ₃	CF ₃	H	CH(CH ₃) ₂
	1591.	CH ₃	OCF ₃	H	CH(CH ₃) ₂
45	1592.	CH ₃	Cl	H	n-C ₄ H ₉
	1593.	CH ₃	F	H	n-C ₄ H ₉
	1594.	CH ₃	CH ₃	H	n-C ₄ H ₉
	1595.	CH ₃	Br	H	n-C ₄ H ₉
	1596.	CH ₃	CF ₃	H	n-C ₄ H ₉
	1597.	CH ₃	OCF ₃	H	n-C ₄ H ₉
	1598.	CH ₃	Cl	H	C(CH ₃) ₃
	1599.	CH ₃	F	H	C(CH ₃) ₃
	1600.	CH ₃	CH ₃	H	C(CH ₃) ₃
	1601.	CH ₃	Br	H	C(CH ₃) ₃
	1602.	CH ₃	CF ₃	H	C(CH ₃) ₃

No.	R ^b	R ^c	R ^d	R ²
1603.	CH ₃	OCF ₃	H	C(CH ₃) ₃
1604.	CH ₃	Cl	H	C ₆ H ₅
1605.	CH ₃	F	H	C ₆ H ₅
5 1606.	CH ₃	CH ₃	H	C ₆ H ₅
1607.	CH ₃	Br	H	C ₆ H ₅
1608.	CH ₃	CF ₃	H	C ₆ H ₅
1609.	CH ₃	OCF ₃	H	C ₆ H ₅
1610.	CH ₃	Cl	H	cyclopropyl
1611.	CH ₃	F	H	cyclopropyl
10 1612.	CH ₃	CH ₃	H	cyclopropyl
1613.	CH ₃	Br	H	cyclopropyl
1614.	CH ₃	CF ₃	H	cyclopropyl
1615.	CH ₃	OCF ₃	H	cyclopropyl
1616.	CH ₃	Cl	H	CH ₂ -cyclopropyl
15 1617.	CH ₃	F	H	CH ₂ -cyclopropyl
1618.	CH ₃	CH ₃	H	CH ₂ -cyclopropyl
1619.	CH ₃	Br	H	CH ₂ -cyclopropyl
1620.	CH ₃	CF ₃	H	CH ₂ -cyclopropyl
1621.	CH ₃	OCF ₃	H	CH ₂ -cyclopropyl
1622.	CH ₃	Cl	H	cyclobutyl
20 1623.	CH ₃	F	H	cyclobutyl
1624.	CH ₃	CH ₃	H	cyclobutyl
1625.	CH ₃	Br	H	cyclobutyl
1626.	CH ₃	CF ₃	H	cyclobutyl
1627.	CH ₃	OCF ₃	H	cyclobutyl
25 1628.	CH ₃	Cl	H	cyclopentyl
1629.	CH ₃	F	H	cyclopentyl
1630.	CH ₃	CH ₃	H	cyclopentyl
1631.	CH ₃	Br	H	cyclopentyl
1632.	CH ₃	CF ₃	H	cyclopentyl
1633.	CH ₃	OCF ₃	H	cyclopentyl
30 1634.	CH ₃	Cl	H	cyclohexyl
1635.	CH ₃	F	H	cyclohexyl
1636.	CH ₃	CH ₃	H	cyclohexyl
1637.	CH ₃	Br	H	cyclohexyl
1638.	CH ₃	CF ₃	H	cyclohexyl
35 1639.	CH ₃	OCF ₃	H	cyclohexyl
1640.	CH ₃	H	Cl	H
1641.	CH ₃	H	F	H
1642.	CH ₃	H	CH ₃	H
1643.	CH ₃	H	Br	H
1644.	CH ₃	H	CF ₃	H
40 1645.	CH ₃	H	OCF ₃	H
1646.	CH ₃	H	Cl	CH ₃
1647.	CH ₃	H	F	CH ₃
1648.	CH ₃	H	CH ₃	CH ₃
1649.	CH ₃	H	Br	CH ₃
45 1650.	CH ₃	H	CF ₃	CH ₃
1651.	CH ₃	H	OCF ₃	CH ₃
1652.	CH ₃	H	Cl	C ₂ H ₅
1653.	CH ₃	H	F	C ₂ H ₅

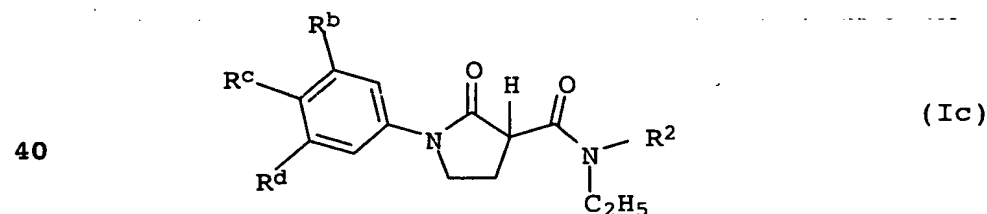
	No.	R ^b	R ^c	R ^d	R ²
5	1654.	CH ₃	H	CH ₃	C ₂ H ₅
	1655.	CH ₃	H	Br	C ₂ H ₅
	1656.	CH ₃	H	CF ₃	C ₂ H ₅
	1657.	CH ₃	H	OCF ₃	C ₂ H ₅
	1658.	CH ₃	H	Cl	n-C ₃ H ₇
10	1659.	CH ₃	H	F	n-C ₃ H ₇
	1660.	CH ₃	H	CH ₃	n-C ₃ H ₇
	1661.	CH ₃	H	Br	n-C ₃ H ₇
	1662.	CH ₃	H	CF ₃	n-C ₃ H ₇
	1663.	CH ₃	H	OCF ₃	n-C ₃ H ₇
15	1664.	CH ₃	H	Cl	CH(CH ₃) ₂
	1665.	CH ₃	H	F	CH(CH ₃) ₂
	1666.	CH ₃	H	CH ₃	CH(CH ₃) ₂
	1667.	CH ₃	H	Br	CH(CH ₃) ₂
	1668.	CH ₃	H	CF ₃	CH(CH ₃) ₂
20	1669.	CH ₃	H	OCF ₃	CH(CH ₃) ₂
	1670.	CH ₃	H	Cl	n-C ₄ H ₉
	1671.	CH ₃	H	F	n-C ₄ H ₉
	1672.	CH ₃	H	CH ₃	n-C ₄ H ₉
	1673.	CH ₃	H	Br	n-C ₄ H ₉
25	1674.	CH ₃	H	CF ₃	n-C ₄ H ₉
	1675.	CH ₃	H	OCF ₃	n-C ₄ H ₉
	1676.	CH ₃	H	Cl	C(CH ₃) ₃
	1677.	CH ₃	H	F	C(CH ₃) ₃
	1678.	CH ₃	H	CH ₃	C(CH ₃) ₃
30	1679.	CH ₃	H	Br	C(CH ₃) ₃
	1680.	CH ₃	H	CF ₃	C(CH ₃) ₃
	1681.	CH ₃	H	OCF ₃	C(CH ₃) ₃
	1682.	CH ₃	H	Cl	C ₆ H ₅
	1683.	CH ₃	H	F	C ₆ H ₅
35	1684.	CH ₃	H	CH ₃	C ₆ H ₅
	1685.	CH ₃	H	Br	C ₆ H ₅
	1686.	CH ₃	H	CF ₃	C ₆ H ₅
	1687.	CH ₃	H	OCF ₃	C ₆ H ₅
	1688.	CH ₃	H	Cl	cyclopropyl
40	1689.	CH ₃	H	F	cyclopropyl
	1690.	CH ₃	H	CH ₃	cyclopropyl
	1691.	CH ₃	H	Br	cyclopropyl
	1692.	CH ₃	H	CF ₃	cyclopropyl
	1693.	CH ₃	H	OCF ₃	cyclopropyl
45	1694.	CH ₃	H	Cl	CH ₂ -cyclopropyl
	1695.	CH ₃	H	F	CH ₂ -cyclopropyl
	1696.	CH ₃	H	CH ₃	CH ₂ -cyclopropyl
	1697.	CH ₃	H	Br	CH ₂ -cyclopropyl
	1698.	CH ₃	H	CF ₃	CH ₂ -cyclopropyl
	1699.	CH ₃	H	OCF ₃	CH ₂ -cyclopropyl
	1700.	CH ₃	H	Cl	cyclobutyl
	1701.	CH ₃	H	F	cyclobutyl
	1702.	CH ₃	H	CH ₃	cyclobutyl
	1703.	CH ₃	H	Br	cyclobutyl
	1704.	CH ₃	H	CF ₃	cyclobutyl

No.	R ^b	R ^c	R ^d	R ²
1705.	CH ₃	H	OCF ₃	cyclobutyl
1706.	CH ₃	H	Cl	cyclopentyl
1707.	CH ₃	H	F	cyclopentyl
5 1708.	CH ₃	H	CH ₃	cyclopentyl
1709.	CH ₃	H	Br	cyclopentyl
1710.	CH ₃	H	CF ₃	cyclopentyl
1711.	CH ₃	H	OCF ₃	cyclopentyl
1712.	CH ₃	H	Cl	cyclohexyl
1713.	CH ₃	H	F	cyclohexyl
10 1714.	CH ₃	H	CH ₃	cyclohexyl
1715.	CH ₃	H	Br	cyclohexyl
1716.	CH ₃	H	CF ₃	cyclohexyl
1717.	CH ₃	H	OCF ₃	cyclohexyl

- 15 Particular preference is also given to the 1-phenylpyrrolidin-2-one-3-carboxamides of the formula Ib (\equiv I where R^a = R^e = H, X = O, Y = O, R¹ = H, R³ = H and n = 0) where R^b, R^c, R^d and R² have the meanings given above, in particular the meanings mentioned as being preferred. Examples of such compounds are the compounds
- 20 Ib.1 to Ib.1717 in which the variables R^b, R^c, R^d and R² together have the meanings given in one row of Table 1.



- Particular preference is also given to the 1-phenylpyrrolidin-2-one-3-carboxamides of the formula Ic (\equiv I where R^a = R^e = H, X = O, Y = O, R¹ = H, R³ = C₂H₅ and n = 0) where R^b, R^c, R^d and R² have the meanings given above, in particular the meanings mentioned as being preferred. Examples of such compounds are the compounds Ic.1 to Ic.1717 in which the variables R^b, R^c, R^d and R²
- 35 together have the meanings given in one row of Table 1.

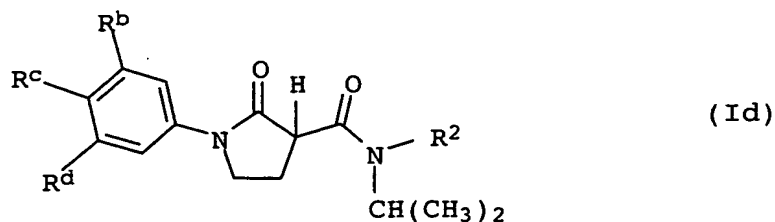


- Particular preference is also given to the 1-phenylpyrrolidin-2-one-3-carboxamides of the formula Id (\equiv I where X = O, Y = O, R¹ = H, R³ = CH(CH₃)₂ and n = 0) where R^b, R^c, R^d and R² have the meanings given above, in particular the meanings mentioned as being preferred. Examples of such compounds are the compounds
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Id.1 to Id.1717 in which the variables R^b , R^c , R^d and R^2 together have the meanings given in one row of Table 1.

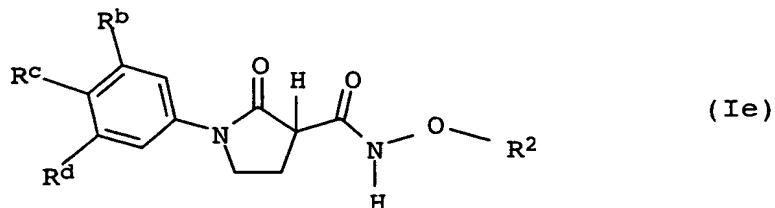
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Particular preference is also given to the 1-phenylpyrrolidin-2-one-3-carboxamides of the formula Ie (\equiv I where $X = O$, $Y = O$, $R^1 = H$, $R^3 = H$, $A = O$ and $n = 1$) where R^b , R^c , R^d and R^2 have the meanings given above, in particular the meanings mentioned as being preferred. Examples of such compounds are the compounds Ie.1 to Ie.1717 in which the variables R^b , R^c , R^d and R^2 together have the meanings given in one row of Table 1.

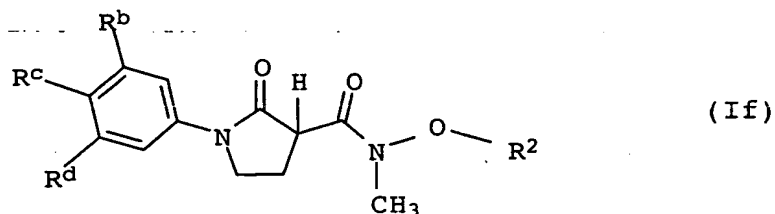
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Particular preference is also given to the 1-phenylpyrrolidin-2-one-3-carboxamides of the formula If (\equiv I where $X = O$, $Y = O$, $R^1 = H$, $R^3 = \text{CH}_3$, $A = O$ and $n = 1$) where R^b , R^c , R^d and R^2 have the meanings given above, in particular the meanings mentioned as being preferred. Examples of such compounds are the compounds If.1 to If.1717 in which the variables R^b , R^c , R^d and R^2 together have the meanings given in one row of Table 1.

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Particular preference is also given to the 1-phenylpyrrolidin-2-one-3-carboxamides of the formula Ig (\equiv I where $X = O$, $Y = O$, $R^1 = H$, $R^3 = \text{C}_2\text{H}_5$, $A = O$ and $n = 1$) where R^b , R^c , R^d and R^2 have the meanings given above, in particular the

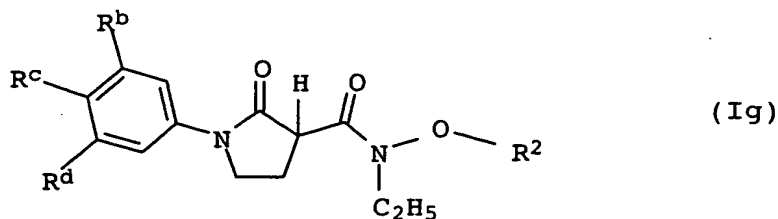
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meanings mentioned as being preferred. Examples of such compounds are the compounds Ig.1 to Ig.1717 in which the variables R^b , R^c , R^d and R^2 together have the meanings given in one row of Table 1.

5

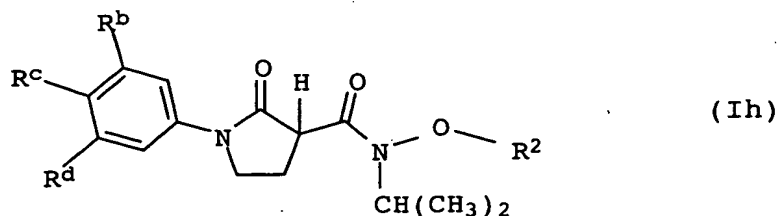
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Particular preference is also given to the 1-phenylpyrrolidin-2-one-3-carboxamides of the formula Ih (\equiv I where $X = O$, $Y = O$, $R^1 = H$, $R^3 = CH(CH_3)_2$, $A = O$ and $n = 1$) where R^b , R^c , R^d and R^2 have the meanings given above, in particular the meanings mentioned as being preferred. Examples of such compounds are the compounds Ih.1 to Ih.1717 in which the variables R^b , R^c , R^d and R^2 together have the meanings given in one row of Table 1.

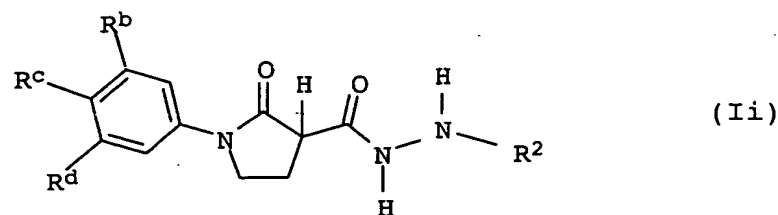
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Particular preference is also given to the 1-phenylpyrrolidin-2-one-3-carboxamides of the formula Ii (\equiv I where $X = O$, $Y = O$, $R^1 = H$, $R^3 = H$, $n = 1$ and $A = NR^{12}$ where $R^{12} = H$) where R^b , R^c , R^d and R^2 have the meanings given above, in particular the meanings mentioned as being preferred. Examples of such compounds are the compounds Ii.1 to Ii.1717 in which the variables R^b , R^c , R^d and R^2 together have the meanings given in one row of Table 1.

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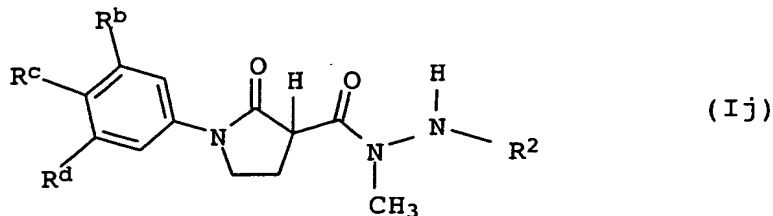
Particular preference is also given to the 1-phenylpyrrolidin-2-one-3-carboxamides of the formula Ij (\equiv I where $X = O$, $Y = O$, $R^1 = H$, $R^3 = CH_3$, $n = 1$ and $A = NR^{12}$ where $R^{12} = H$) where R^b , R^c ,

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R^d and R^2 have the meanings given above, in particular the meanings mentioned as being preferred. Examples of such compounds are the compounds Ij.1 to Ij.1717 in which the variables R^b , R^c , R^d and R^2 together have the meanings given in one row of Table 1.

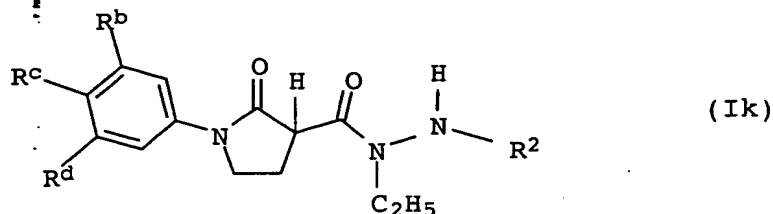
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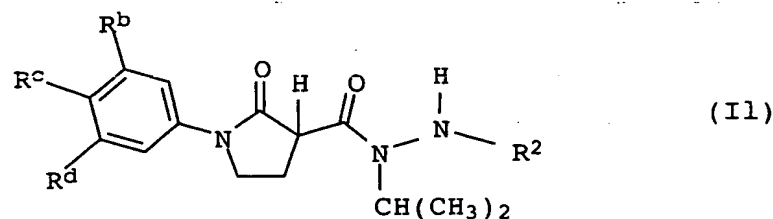
Particular preference is also given to the 1-phenylpyrrolidin-2-one-3-carboxamides of the formula Ik (\equiv I where $X = O$, $Y = O$, $R^1 = H$, $R^3 = C_2H_5$, $n = 1$ and $A = NR^{12}$ where $R^{12} = H$) where R^b , R^c , R^d and R^2 have the meanings given above, in particular the meanings mentioned as being preferred. Examples of such compounds are the compounds Ik.1 to Ik.1717 in which the variables R^b , R^c , R^d and R^2 together have the meanings given in one row of Table 1.

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Particular preference is also given to the 1-phenylpyrrolidin-2-one-3-carboxamides of the formula Il (\equiv I where $X = O$, $Y = O$, $R^1 = H$, $R^3 = CH(CH_3)_2$, $n = 1$ and $A = NR^{12}$ where $R^{12} = H$) where R^b , R^c , R^d and R^2 have the meanings given above, in particular the meanings mentioned as being preferred. Examples of such compounds are the compounds Il.1 to Il.1717 in which the variables R^b , R^c , R^d and R^2 together have the meanings given in one row of Table 1.

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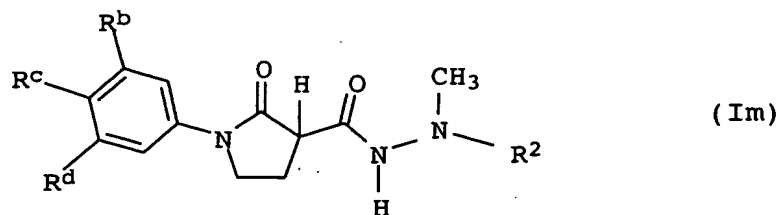


Particular preference is also given to the 1-phenylpyrrolidin-2-one-3-carboxamides of the formula Im (\equiv I where $X = O$, $Y = O$, $R^1 = H$, $R^3 = H$, $n = 1$ and $A = NR^{12}$ where $R^{12} = CH_3$) where R^b , R^c , R^d and R^2 have the meanings given above, in particular the

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meanings mentioned as being preferred. Examples of such compounds are the compounds Im.1 to Im.1717 in which the variables R^b , R^c , R^d and R^2 together have the meanings given in one row of Table 1.

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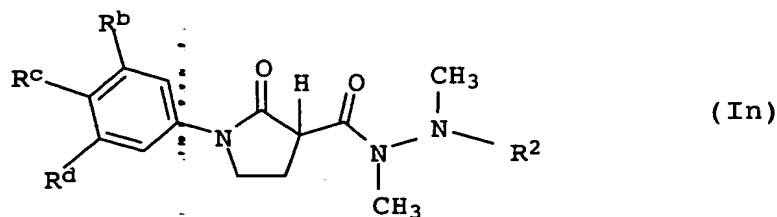


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Particular preference is also given to the 1-phenylpyrrolidin-2-one-3-carboxamides of the formula In (\equiv I where $X = O$, $Y = O$, $R^1 = H$, $R^3 = CH_3$, $n = 1$ and $A = NR^{12}$ where $R^{12} = CH_3$) where R^b , R^c , R^d and R^2 have the meanings given above, in particular the

15 meanings mentioned as being preferred. Examples of such compounds are the compounds In.1 to In.1717 in which the variables R^b , R^c , R^d and R^2 together have the meanings given in one row of Table 1.

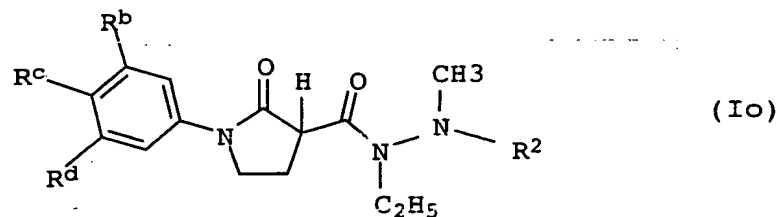
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25 Particular preference is also given to the 1-phenylpyrrolidin-2-one-3-carboxamides of the formula Io (\equiv I where $X = O$, $Y = O$, $R^1 = H$, $R^3 = C_2H_5$, $n = 1$ and $A = NR^{12}$ where $R^{12} = CH_3$) where R^b , R^c , R^d and R^2 have the meanings given above, in particular the meanings mentioned as being preferred. Examples of

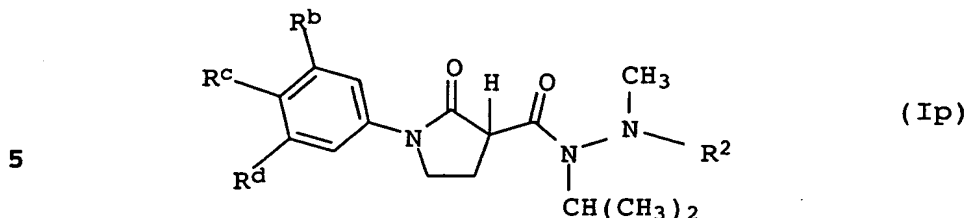
30 such compounds are the compounds Io.1 to Io.1717 in which the variables R^b , R^c , R^d and R^2 together have the meanings given in one row of Table 1.

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40 Particular preference is also given to the 1-phenylpyrrolidin-2-one-3-carboxamides of the formula Ip (\equiv I where $X = O$, $Y = O$, $R^1 = H$, $R^3 = CH(CH_3)_2$, $n = 1$ and $A = NR^{12}$ where $R^{12} = CH_3$) where R^b , R^c , R^d and R^2 have the meanings given above, in particular the meanings mentioned as being preferred. Examples of such compounds

45 are the compounds Ip.1 to Ip.1717 in which the variables R^b , R^c , R^d and R^2 together have the meanings given in one row of Table 1.

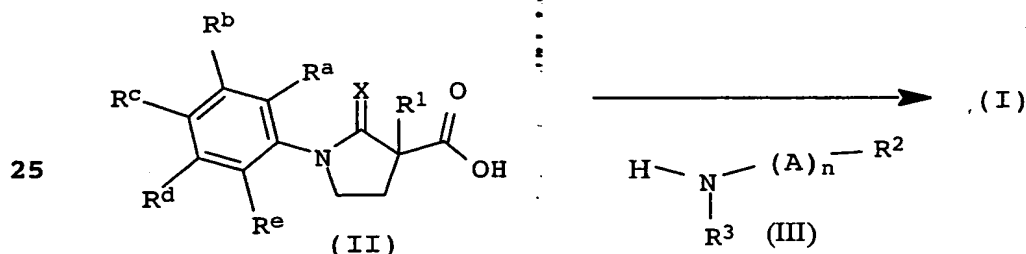


The 1-phenylpyrrolidin-2-one-3-carboxamides of the formula I according to the invention can be prepared, for example, by one of the processes A to G described below.

A) Amidation of a carboxylic acid II or a carboxylic acid derivative of II

15 The preparation of the compound I according to the invention can be carried out, for example, according to Scheme 1 by reacting an activated form of a pyrrolidine-3-carboxylic acid of the formula II with an amine III.

20 Scheme 1:



30 In Scheme 1, the variables R^1 , X , R^a , R^b , R^c , R^d , R^e , A , n , R^2 and R^3 are as defined above. Such reactions are known, for example from WO 01/83459, and can be applied in an analogous manner to the reaction illustrated in Scheme 1. The carboxylic acid II is preferably initially activated by carrying out the reaction in the presence of a coupling agent. Suitable coupling agents are, for example, N,N'-carbonyldiimidazole or carbodiimides, such as dicyclohexylcarbodiimide. These compounds are generally employed in an at least equimolar amount and up to a four-fold excess, based on the carboxylic acid II. If appropriate, it may be advantageous to carry out the reaction of the carboxylic acid II with the coupling agent in the presence of a catalytic amount of a tertiary aminopyridine, such as 4-dimethylaminopyridine (DMAP). In this case, the amount of aminopyridine added is preferably 5 to 10 mol%, based on the carboxylic acid II. The reaction is usually carried out in a solvent. Suitable solvents are, for example, chlorinated hydrocarbons, such as methylene chloride,

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1,2-dichloroethane, ethers, for example dialkyl ethers, such as diethyl ether, methyl tert-butyl ether, or cyclic ethers, such as tetrahydrofuran or dioxane, carboxamides, such as dimethylformamide, N-methylactams, such as

5 N-methylpyrrolidone, nitriles, such as acetonitrile, aromatic hydrocarbons, such as toluene, or mixtures of these.

The molar ratio of amine III to carboxylic acid II is generally at least 0.9:1, preferably at least 1:1. If

10 appropriate, it may be advantageous to employ the amine in a slight excess, for example in an excess of up to 30%, based on the carboxylic acid II.

In general, the reaction temperature is in the range from 0°C

15 to the boiling point of the solvent.

Alternatively, the carboxylic acid II can initially be activated by converting it into its acid halide, preferably its acid chloride. Means for this purpose are known, for

20 example from US 4,874,422. Suitable compounds are inorganic acid halides, preferably acid chlorides, such as thionyl chloride, phosphoryl chloride, phosphorus pentachloride or phosphorus trichloride, and organic acid chlorides, such as oxalyl chloride. The acid halide of II formed can be isolated and then be reacted with the amine III. It is also possible

25 to react the acid chloride of II formed directly, without isolation, with the amine III. If appropriate, the reactivity of the acid halide is enhanced by adding catalytic amounts of an N,N-dialkylcarboxamide, such as dimethylformamide. The

30 halogenating agent is usually employed in an at least equimolar amount, based on the carboxylic acid II. The acid halides thionyl chloride, phosphorus trichloride or phosphoryl chloride can simultaneously act as solvent. Suitable solvents are furthermore solvents which are inert

35 under the reaction conditions, for example chlorinated hydrocarbons, such as methylene chloride, 1,2-dichloroethane, aromatic hydrocarbons, such as benzene or toluene, aliphatic and cycloaliphatic hydrocarbons, such as hexane, petroleum ether, cyclohexane, and mixtures thereof. The reaction

40 temperature is generally between room temperature and the boiling point of the solvent. After the reaction has ended, excess halogenating agent is generally removed. The resulting acid halide of II is then reacted with the amine III. In

45 general, the amine III is dissolved in the solvent which was also used for preparing the carbonyl halide, unless the solvent is one of the acid halides mentioned above.

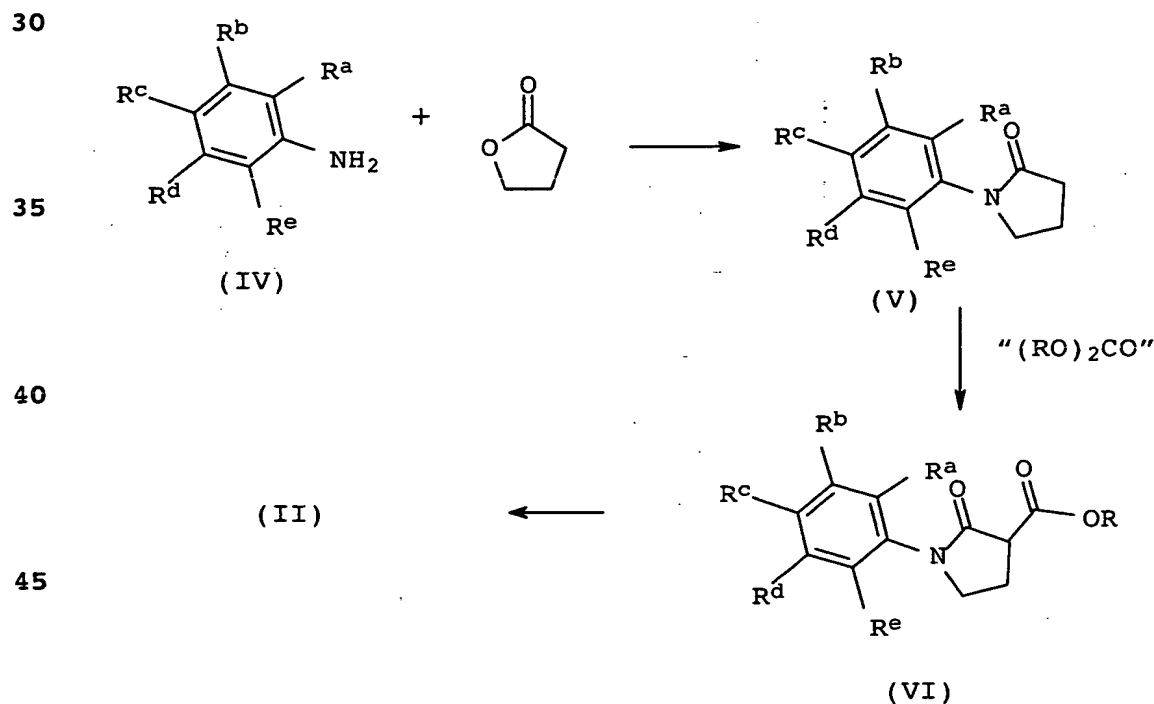
If appropriate, the reaction is carried out in the presence of an auxiliary base which is preferably employed in an equimolar amount or an up to four-fold excess, based on the carboxylic acid II. Suitable bases are, for example, amines such as 1,5-diazabicyclo[4.3.0]non-5-ene (DBN), 1,8-diazabicyclo[5.4.0]undec-7-ene (DBU), pyridine, α -, β -, γ -lutidine or triethylamine.

It is, of course, also possible to use other methods for activating the carboxylic acid II. Such methods are described in the prior art, for example in J. Falbe, Houben Weyl, Methoden der Organischen Chemie [Methods of organic chemistry], Vol. E5, 4th Ed., 1985, p. 941 ff.

In a further process variant, the corresponding carboxylic acid ester of II (carboxylic acid ester VI), in particular the C₁-C₄-alkyl ester of II and especially the methyl or ethyl ester of II, is reacted with the amine III, if appropriate in the presence of a base. Regarding a suitable base, solvent and reaction temperatures, reference is made to what was said above. The preparation of the carboxylic acid ester VI is described below.

Compounds of the formula II where R¹ = H can be prepared, for example, similarly to a process described in Journal of Heterocyclic Chemistry, 3 (1966), 311. The synthesis is shown in Scheme 2.

Scheme 2:



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In Scheme 2, the variables R^a , R^b , R^c , R^d , R^e are as defined above and R is C_1 - C_4 -alkyl. The reaction of the aniline compound IV with butyrolactone is usually carried out in the presence of an inorganic acid, such as sulfuric acid, phosphoric acid or hydrochloric acid, or in the presence of an organic acid, such as acetic acid. The reaction can be carried out in the absence of a solvent or in the presence of a solvent. Suitable solvents are all solvents which are inert under the reaction conditions. However, the reaction is preferably carried out in the absence of a solvent. If the reaction is carried out in the absence of a solvent, the butyrolactone is employed in an excess, based on the aniline IV. The reaction temperatures are generally in the range of from 20°C to the boiling point of the solvent.

In the next step, the resulting pyrrolidinone V is generally reacted without further purification, for example with a carbonate $(RO)_2CO$ or a synthetic equivalent, such as a chloroformic ester. To this end, the pyrrolidinone V is generally initially converted into the corresponding enolate by treatment with a suitable base. Suitable bases include in particular organolithium compounds, such as *n*-butyllithium, *tert*-butyllithium and phenyllithium, lithium amides, such as lithium diisopropylamide, and alkali metal hydrides, such as sodium hydride. The reaction is generally carried out in an organic solvent. Suitable solvents are inert solvents, such as aliphatic and cycloaliphatic hydrocarbons, such as hexane, petroleum ether, cyclohexane, ethers, for example dialkyl ethers, such as diethyl ether, methyl *tert*-butyl ether, or cyclic ethers, such as tetrahydrofuran or dioxane, and also mixtures of these. In general, the deprotonation of the compound V is carried out at low temperatures to about room temperature, preferably at about 0°C. To this end, the base is employed in an at least equimolar amount, preferably a 1.1- to 4-fold molar excess, based on the compound V.

The subsequent introduction of the alkoxycarbonyl group is carried out, for example, using a carbonic acid diester, such as dimethyl carbonate or diethyl carbonate. The carbonic acid diester and the enolate of the compound V are usually employed in equimolar amounts. It is, of course, possible for one of the two reactants to be employed in a slight excess. The temperature required for the reaction is generally in the range of from 0°C to the boiling point of the solvent.

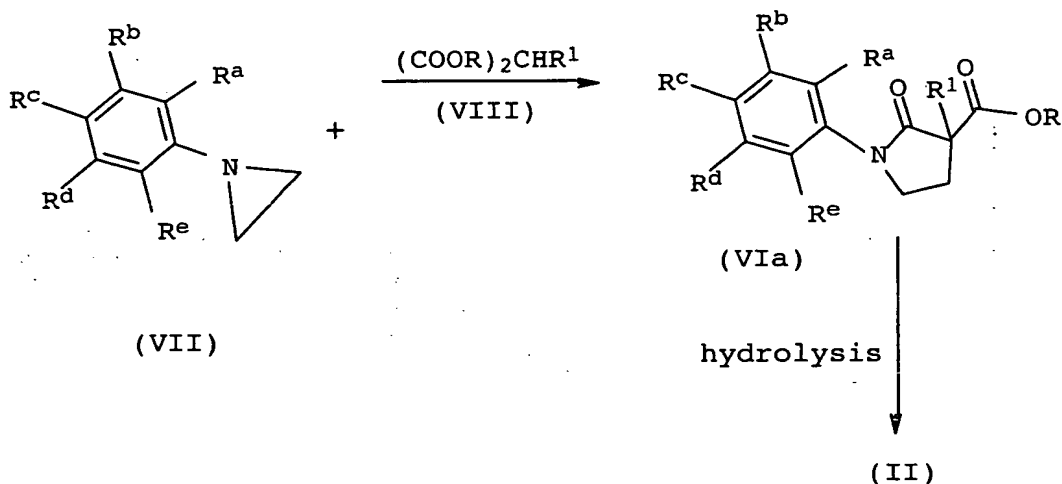
The carboxylic acid ester VI is then hydrolyzed by known methods (see, for example, Organikum, 17th Edition, VEB

Deutscher Verlag der Wissenschaften, 1988, p. 415) to give the carboxylic acid II. The hydrolysis can be carried out either in acidic medium using strong mineral acids, such as concentrated hydrochloric acid or sulfuric acid, or organic acids, such as glacial acetic acid, or mixtures of these in the presence of water, or in alkaline medium using bases, such as alkali metal hydroxide, for example sodium hydroxide or potassium hydroxide, if appropriate in the presence of water.

Suitable solvents both for acidic and basic hydrolysis of esters are, for example, ethers, for example dialkyl ethers, such as diethyl ether, methyl tert-butyl ether, or cyclic ethers, such as tetrahydrofuran or dioxane, alcohols, water and mixtures of these solvents. The reaction temperature is usually between room temperature and the boiling point of the solvent.

The compounds II can furthermore be prepared by aminoethylation of malonic acid esters VII in which R^1 is as defined above and R is C_1 - C_4 -alkyl with phenylaziridines VII and subsequent hydrolysis. The synthesis is shown in Scheme 3 and can be carried out similarly to known methods as described, for example, in Archiv der Pharmazie (Weinheim) 302(4) (1969), 253, Justus Liebigs Ann. Chem. 716 (1968), 121 - 126 or in Angew. Chem. 74, (1962), 694.

Scheme 3:



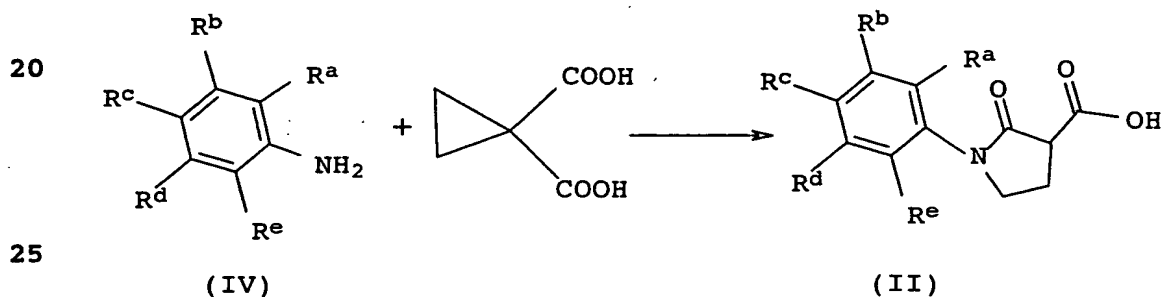
The reaction is generally carried out in the presence of LiH/LiI in a solvent. Suitable solvents include aromatic solvents, such as benzene, toluene or xylene. Frequently, the aziridine VII and the malonic acid ester are employed in approximately equimolar amounts. It may be advantageous to

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employ an excess of malonic acid ester VIII, preferably an excess of up to 30%, based on the aziridine VII. The resulting ester VIa is then converted according to known methods by hydrolysis in acidic or alkaline medium into the corresponding carboxylic acids II. With regard to ester hydrolysis, reference is made to what was said above.

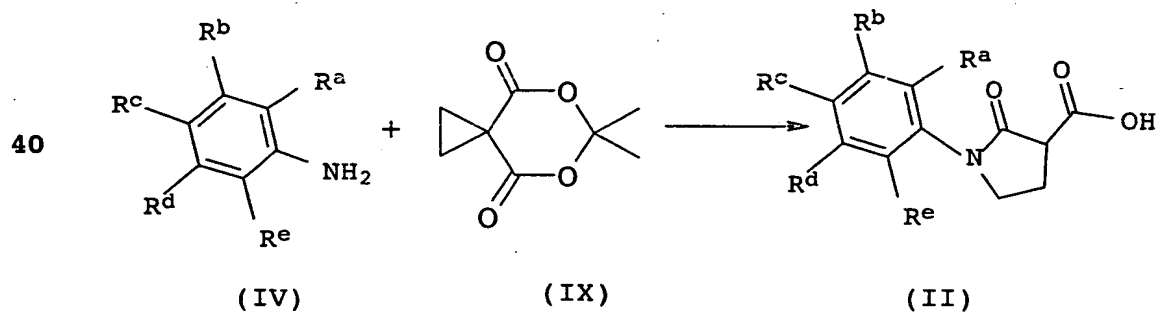
Compounds of the formula II in which R¹ is H can furthermore be prepared similarly to a process described in JP 2000143624-A. To this end, anilines IV are reacted with 1,1-cyclopropanedicarboxylic acid. The synthesis route is shown in Scheme 4. The reaction is usually carried out in water or in an aliphatic nitrile, such as acetonitrile, or in mixtures thereof with water, at temperatures between 40 and 100°C.

Scheme 4:



Compounds of the formula II in which R¹ is H can furthermore be obtained similarly to processes described in J. Am. Chem. Soc. 97 (1975), 3239 or Organic Synthesis 60, (1981), 66. The reaction of the aniline IV with the dioxaspirooctanedione IX gives the carboxylic acid II. The synthesis route is shown in Scheme 5.

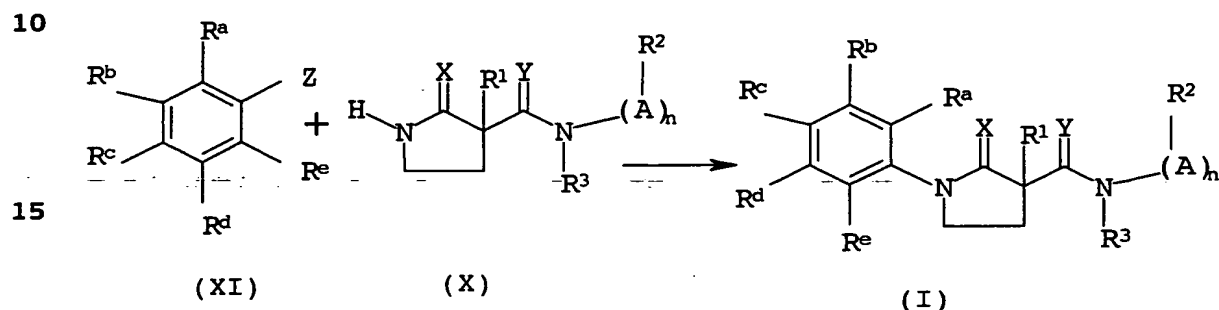
Scheme 5:



B) Linking a pyrrolidinone X to an aromatic compound XI

Compounds of the formula I can furthermore be prepared by reacting suitably substituted pyrrolidinones X with aromatic compounds of the formula XI according to the synthesis shown in Scheme 6.

Scheme 6:



20 In Scheme 6, the variables R^a , R^b , R^c , R^d , R^e , X , Y , A , n , R^1 , R^2 and R^3 are as defined above. Z is halogen, preferably fluorine, chlorine or bromine, or $B(OH)_2$, $B(OR')_2$ or $Sn(R')_3$. In these radicals, R' is aryl, such as phenyl, or C_1 - C_{10} -alkyl.

25 The reaction is preferably carried out in a solvent, in particular a polar aprotic solvent, such as dimethylformamide, dimethyl sulfoxide, N-methylpyrrolidone, dimethylacetamide, an ether, such as diethyl ether,

30 tetrahydrofuran or dioxane, and mixtures of these solvents.

In general, the reaction is carried out at temperatures above room temperature, preferably in the range from 50 to 200°C. To this end, the compounds of the formulae X and XI are preferably employed in approximately equimolar amounts. It is, of course, also possible to use an excess of one of the components, the excess preferably being not more than 50 mol%, in particular not more than 20 mol%, based on the component which is present in a substoichiometric amount.

40 The compounds I according to the invention are furthermore obtained by coupling XI (for example $Z = Cl$, Br , I , $B(OR)_2$, SnR_3) with a pyrrolidinone X, preferably in the presence of catalytically active amounts of a palladium, copper or nickel compound, if appropriate in the presence of a base, in an organic solvent or a mixture of a solvent with water, at room temperature or elevated temperatures. Processes for coupling

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a phenylboronic acid are described, for example, in WO 02/42275.

- Suitable palladium catalysts are, in addition to palladium carboxylates, such as palladium(II) acetate, also palladium/phosphine complexes, such as tetrakis(triphenylphosphine)palladium, bistris(triphenylphosphine)palladium(II) chloride, bis(1,2-diphenylphosphinoethane)palladium(II) chloride, bis(1,3-diphenylphosphinopropane)palladium(II) chloride, bis(1,4-diphenylphosphinobutane)palladium(II) chloride and bis(diphenylphosphino)ferrocenylpalladium(II) chloride. However, it is also possible to react palladium halides such as palladium(II) chloride in situ with phosphine ligands, giving the catalytically active complexes. Suitable phosphine ligands are, for example, arylphosphines which are unsubstituted or substituted in the ortho-, meta- or para-position by halogen, alkyl and/or SO_3H , such as triphenylphosphine, 1,2-bis(diphenylphosphino)ethane, 1,3-bis(diphenylphosphino)propane, 1,4-bis(diphenylphosphino)butane, bis(diphenylphosphino)ferrocene, heterarylphosphines, such as trifurylphosphine or tripyridylphosphine.
- Suitable Ni catalysts are nickel(II) acetylacetonate alone or in combination with the abovementioned phosphine ligands, or Ni(II) acetylacetonate with imidazolium carbene ligands, and also complexes of nickel(II) salts with the abovementioned phosphine ligands, for example bis(triphenylphosphine)nickel(II) chloride, [1,3-bis(diphenylphosphino)propane]nickel(II) chloride, [1,4-bis(diphenylphosphino)butane]nickel(II) chloride and [bis(diphenylphosphino)ferrocene]nickel(II) chloride.
- Suitable copper compounds are, in particular, copper(I) compounds, such as CuCl , CuBr and the like.

The catalyst is usually employed in substoichiometric amounts, preferably of 0.001-0.8 equivalents and particularly preferably of 0.01 to 0.5 equivalents, based on the pyrrolidinone XI used.

If appropriate, it may be advantageous to convert the compound X initially with a base into its salt. Suitable bases are, for example, alkali metal hydrides, such as sodium hydride, and sodium alkoxides, such as sodium methoxide and sodium ethoxide, lithium amides, such as lithium

diisopropylamide, and also organolithium compounds, such as butyllithium and phenyllithium.

5 The molar ratio of compound XI to compound X is preferably in the range from 0.95:1 to 1:1.5.

10 Suitable bases are, if required, alkali metal and alkaline earth metal hydroxides, alkali metal (bi)carbonates and alkali metal phosphates, such as NaOH, NaHCO₃, Na₂CO₃, KHCO₃, K₂CO₃, Ba(OH)₂, K₃PO₄, alkali metal, alkaline earth metal, thallium and transition metal alkoxides, such as sodium ethoxide and thallium ethoxide. Other suitable bases are alkali metal fluorides, such as potassium fluoride, cesium fluoride, ammonium fluorides and tetrabutylammonium fluoride.
15 The base is usually employed in an approximately stoichiometric amount or in up to 10-fold excess, based on the compound II.

20 Suitable solvents are organic solvents, such as DMF, dimethylacetamide, toluene, tetrahydrofuran (THF), dioxane and dimethoxyethane. If the coupling is carried out with boronic acid, the abovementioned solvents can also be employed in a mixture with water, for example in a ratio of about 5:1 to 1:5, preferably in a ratio of about 2:1 to 1:2
25 and in particular of about 1:1.

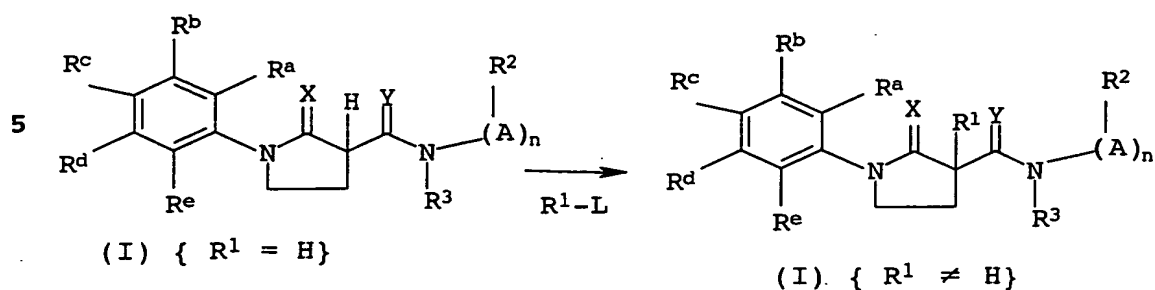
The reaction temperature is usually above the melting point and can be up to the boiling point of the solvent. It is preferably in the range between 50 and 150°C.

30 The pyrrolidino compounds X can be prepared by customary processes, for example analogously to the procedure described in process A.

35 C) Alkylation of compounds of the formula I in which R¹ = H

Compounds of the formula I in which R¹ is hydrogen can be prepared according to general methods by treatment with an alkylation agent R¹-L in compounds of the formula I in which
40 R¹ is not hydrogen. The synthesis route is shown in Scheme 7.

Scheme 7:



15 In Scheme 7, the variables R^1 , R^a , R^b , R^c , R^d , R^e , X , Y , A , n , R^1 , R^2 and R^3 are as defined above. L is a nucleophilically displaceable leaving group, such as halogen, for example chlorine, bromine, iodine, or imidazolyl, carboxylate, such as acetate, arylsulfonate or alkylsulfonate, for example mesylate or triflate. The reaction is usually carried out in the presence of a base. Suitable bases include alkali metal or alkaline earth metal hydroxides, metal hydrides, such as alkali metal hydrides, for example sodium hydride, tertiary alkylamines, such as triethylamine, aromatic amines, such as pyridine, α -, β -, γ -lutidine, lithium diisopropylamide.

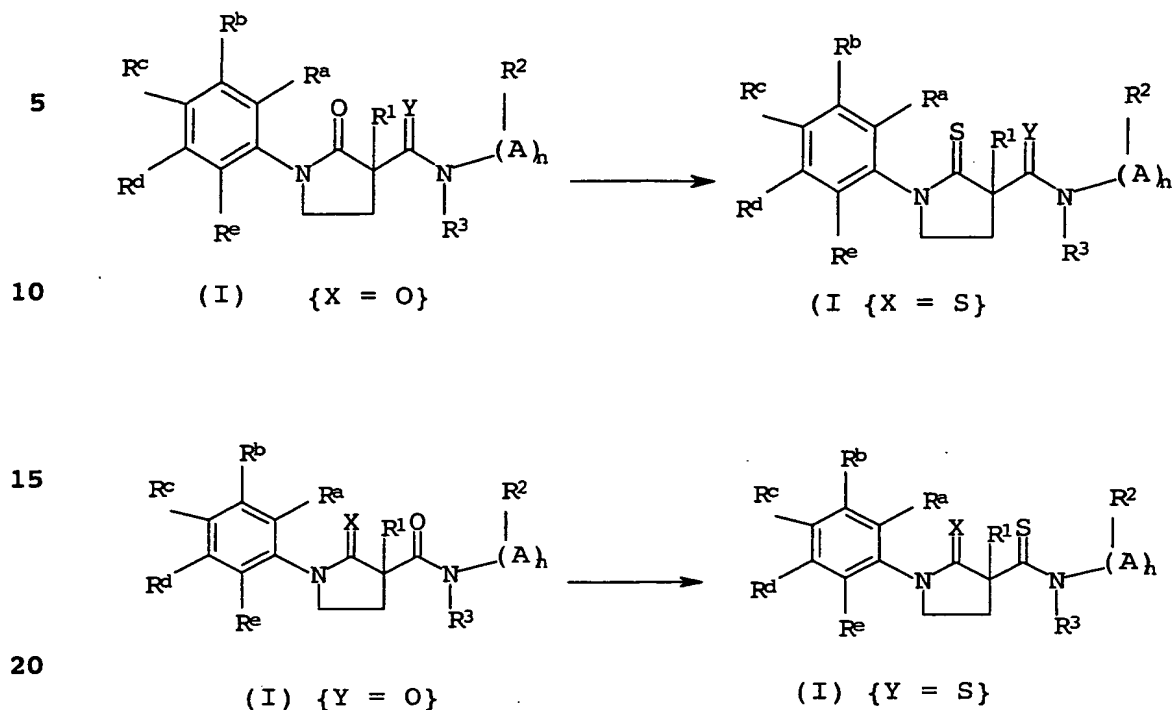
25 Suitable solvents are, for example, chlorinated hydrocarbons, such as methylene chloride or 1,2-dichloroethane, aromatic hydrocarbons, such as toluene, xylene or chlorobenzene, ethers, such as diethyl ether, methyl tert-butyl ether, tetrahydrofuran, dioxane, polar aprotic solvents, such as acetonitrile, dimethylformamide or dimethyl sulfoxide.

30 In general, the reaction temperature is in the range from 0°C to the boiling point of the reaction mixture.

35 D) Sulfurization of the compounds of the formula I in which X or Y is oxygen.

40 Compounds of the formula I in which X or Y is oxygen can be prepared according to general methods by treatment with a sulfurizing agent in compounds of the formula I in which X or Y is sulfur. This synthesis route is illustrated in Scheme 8.

Scheme 8:



25 In Scheme 8, the variables R^a , R^b , R^c , R^d , R^e , X , Y , A , n , R^1 , R^2 and R^3 are as defined above. Examples of suitable sulfurizing agents are phosphorus(V) sulfides, organotin sulfides, and also organophosphorus sulfides (see also J. March, Advanced Organic Synthesis, 2nd Edition, Wiley Interscience 1985, p. 794 and the literature cited therein).

30 Particularly suitable sulfurizing agents are phosphorus(V) sulfide and 2,4-bis(4-methoxyphenyl)-1,3,2,4-dithiadiphosphetane-2,4-dithione ("Lawesson's reagent"). Sulfurization processes are described, for example, in WO 95/33718. The reaction can be carried out in a solvent or

35 neat. Suitable solvents are all solvents which are inert under the reaction conditions, for example aromatic hydrocarbons, such as benzene, toluene, xylene, chlorobenzene, basic solvents, such as pyridine, ethers, such as diethyl ether, 1,2-dimethoxyethane or tetrahydrofuran,

40 etc. The temperatures required for the reaction are generally above room temperature and in particular in the range of from 50°C to the boiling point of the reaction mixture.

E) Condensation of an anilide XII

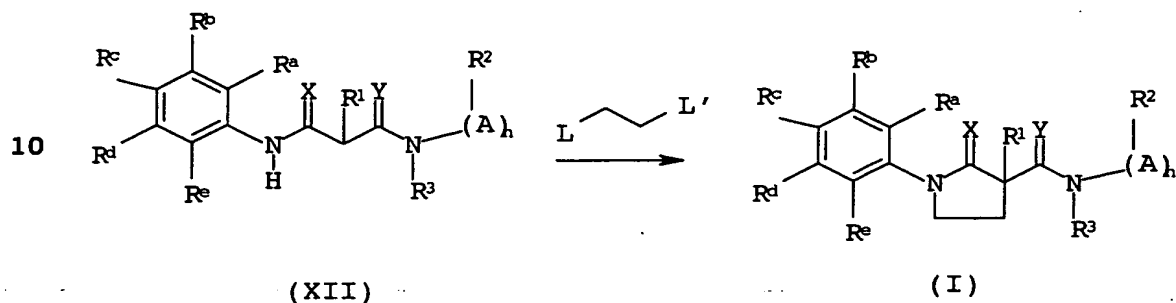
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A further route to the compounds I according to the invention is the reaction of an anilide XII with a suitable

difunctional compound $L-CH_2-CH_2-L'$ with ring closure according to Scheme 9.

Scheme 9:

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In Scheme 9, the variables R^a , R^b , R^c , R^d , R^d , R^e , X , Y , A , n , R^1 , R^2 and R^3 are as defined above, L is as defined in C) and L' has the meaning of L .

20

The cyclization is carried out in the presence of a base.

Suitable bases are all bases mentioned under C). In general, the reaction is carried out in an inert solvent. Suitable solvents are in particular chlorinated hydrocarbons, such as methylene chloride or 1,2-dichloroethane, aromatic

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hydrocarbons, such as toluene, xylene or chlorobenzene, ethers, such as diethyl ether, methyl tert-butyl ether, tetrahydrofuran, dioxane, polar aprotic solvents, such as acetonitrile, dimethylformamide or dimethyl sulfoxide. The starting material XII and the difunctional compound

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$L-CH_2-CH_2-L'$ are expediently employed in approximately equimolar amounts; however, to optimize the conversion, it may be advantageous to use an excess of one of the two components. The reaction is generally carried out at a temperature between room temperature and the boiling point of the reaction mixture.

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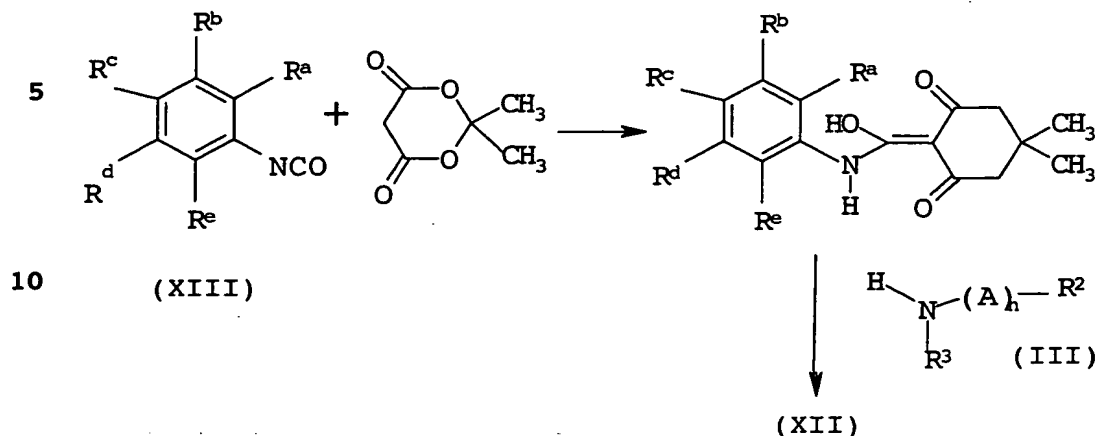
The starting materials XII can be prepared in two steps similarly to the process described in Synlett 12 (1969), 1209. In the first step, an isocyanate XIII is reacted with meldrum acid (2,2-dimethyl-1,3-dioxane-4,6-dione). In the

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second step, the resulting product is then reacted with a suitable amine III. In Scheme 10, the variables R^a , R^b , R^c , R^d , R^d , R^e , X , Y , A , n , R^1 , R^2 and R^3 are as defined above.

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Scheme 10



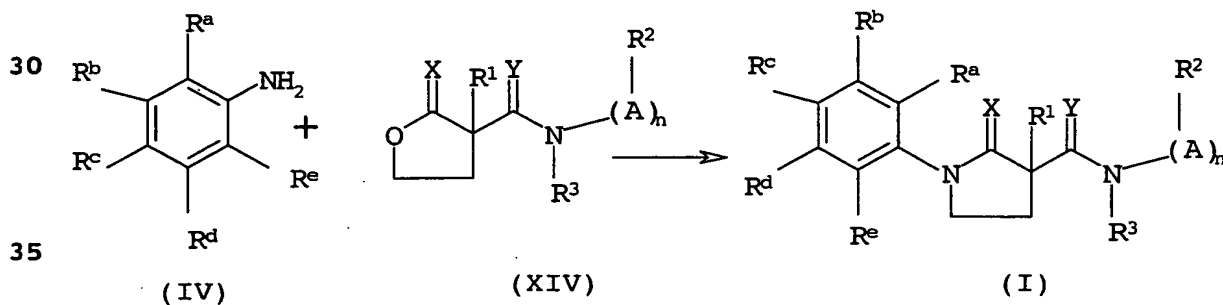
15 F) Condensations

F.1 Condensation of anilines IV with tetrahydro-2-furanones XIV

20 The compounds I according to the invention can be prepared, for example, by condensing anilines IV with tetrahydro-2-furanones XIV according to the synthesis route shown in Scheme 11. Analogous reactions are known, for example from Tetrahedron Letters, 31 (21) (1990), 2991, and can be applied to the preparation of the compounds according to the invention.

25

Scheme 11:



40 In Scheme 11, the variables R^a , R^b , R^c , R^d , R^e , X , Y , A , n , R^1 , R^2 and R^3 are as defined above. The reaction of the anilines IV is usually carried out in a carboxylic acid, such as acetic acid, at temperatures in the range from 0°C to 100°C . In general, the starting materials are employed in equimolar amounts, or one of the two components is employed in excess.

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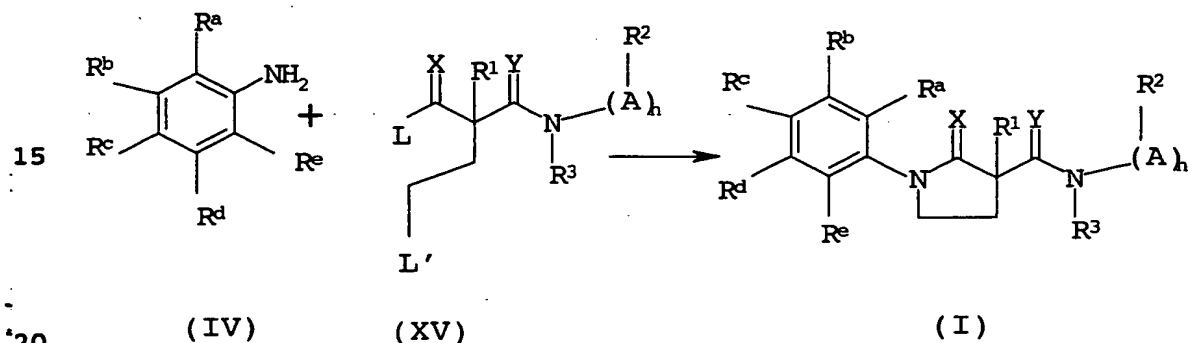
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F.2 Condensation of anilines IV with carboxylic acid derivatives XV and subsequent cyclization

The compounds I according to the invention can be prepared, for example, by condensing anilines IV with carboxylic acid derivatives XV according to the synthesis route shown in Scheme 12.

Scheme 12:

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In Scheme 12, the variables R^a , R^b , R^c , R^d , R^e , X , Y , A , n , R^1 , R^2 and R^3 are as defined above. L is as defined in C) and L' has the meaning of L . The reaction of the aniline IV with the carboxylic acid derivative XV is usually carried out in the presence of a base. Suitable bases are, for example, amines, such as 1,5-diazabicyclo[4.3.0]non-5-ene (DBN), 1,8-diazabicyclo[5.4.0]undec-7-ene (DBU), pyridine or triethylamine. The base is usually employed in up to six-fold excess, based on the carboxylic acid derivative XV. The reaction is generally carried out in a solvent. Suitable solvents are, for example, chlorinated hydrocarbons, such as methylene chloride, 1,2-dichloroethane, ethers, for example dialkyl ethers, such as diethyl ether, methyl tert-butyl ether, or cyclic ethers, such as tetrahydrofuran or dioxane, carbonamides, such as dimethylformamide, N-methyl lactams, such as N-methylpyrrolidone, nitriles, such as acetonitrile, aromatic hydrocarbons, such as toluene, aromatic amines, such as pyridine, or mixtures of these. In general, the reaction temperature is in a range of from $0^\circ C$ to the boiling point of the solvent.

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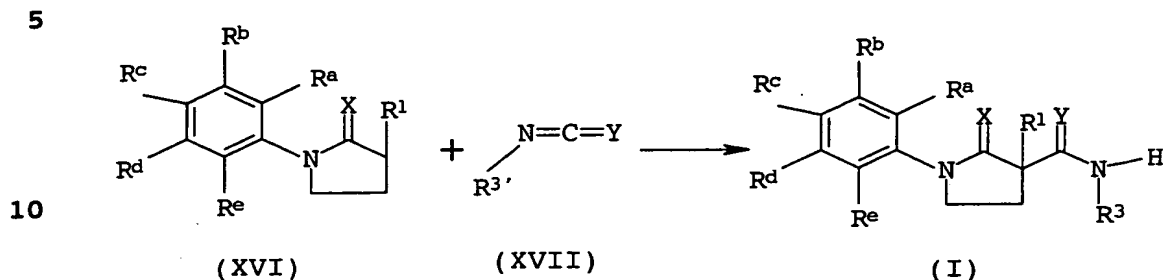
G) Reaction of a pyrrolidinone XVI with an iso(thio)cyanate XVII

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Compounds of the formula I can be prepared by reacting pyrrolidinones XVI with an iso(thio)cyanate XVII in the presence of a base according to the synthesis route shown in

Scheme 13. Such reactions are known, for example, from US 5,185,349.

Scheme 13:



15 In Scheme 13, the variables R^a , R^b , R^c , R^d , R^e , X , Y and R^1 are as defined above. $R^{3'}$ has the meanings mentioned for R^3 which are different from hydrogen. To prepare compounds I where $R^3 = H$, preference is given to using the salt of an isocyanate or isothiocyanate, for example sodium iso(thio)cyanate or potassium iso(thio)cyanate.

20 :
Suitable bases include alkali metal hydrides, such as sodium hydride or potassium hydride, organolithium compounds, such as lithium diisopropylamide. In general, the reaction is carried out in a solvent. Suitable solvents include ethers, such as diethyl ether, methyl tert-butyl ether,
25 tetrahydrofuran, 1,4-dioxane, anisole, glycol ethers, such as dimethyl glycol ether, hydrocarbons, such as hexane, petroleum ether or mixtures of these.

30 The compounds I and their agriculturally useful salts are suitable - both as isomer mixtures and in the form of the pure isomers - as herbicides. The herbicidal compositions comprising I permit very good control of plant growth on uncultivated areas. In crops such as wheat, rice, corn, soybean and cotton, they are
35 effective against broad-leaved weeds and harmful grasses without significantly damaging the crops. This effect occurs in particular at low application rates.

Depending on the particular application method, the compounds I
40 or the herbicidal compositions comprising them may be used in a further number of crops for eliminating unwanted plants. Suitable are, for example, the following crops:

Allium cepa, Ananas comosus, Arachis hypogaea, Asparagus
45 officinalis, Beta vulgaris spec. altissima, Beta vulgaris spec. rapa, Brassica napus var. napus, Brassica napus var. napobrassica, Brassica rapa var. silvestris, Camellia sinensis,

Carthamus tinctorius, Carya illinoensis, Citrus limon, Citrus sinensis, Coffea arabica (Coffea canephora, Coffea liberica), Cucumis sativus, Cynodon dactylon, Daucus carota, Elaeis guineensis, Fragaria vesca, Glycine max, Gossypium hirsutum, 5 (Gossypium arboreum, Gossypium herbaceum, Gossypium vitifolium), Helianthus annuus, Hevea brasiliensis, Hordeum vulgare, Humulus lupulus, Ipomoea batatas, Juglans regia, Lens culinaris, Linum usitatissimum, Lycopersicon lycopersicum, Malus spec., Manihot esculenta, Medicago sativa, Musa spec., Nicotiana tabacum 10 (N.rustica), Olea europaea, Oryza sativa, Phaseolus lunatus, Phaseolus vulgaris, Picea abies, Pinus spec., Pisum sativum, Prunus avium, Prunus persica, Pyrus communis, Ribes sylvestre, Ricinus communis, Saccharum officinarum, Secale cereale, Solanum tuberosum, Sorghum bicolor (S. vulgare), Theobroma cacao, 15 Trifolium pratense, Triticum aestivum, Triticum durum, Vicia faba, Vitis vinifera and Zea mays.

The compounds I may also be used in crops which are tolerant to the action of herbicides as a result of breeding, including the 20 use of genetic engineering methods.

The compounds I or the herbicidal compositions comprising them can be used, for example, in the form of directly sprayable aqueous solutions, powders, suspensions, including highly 25 concentrated aqueous, oily or other suspensions or dispersions, emulsions, oil dispersions, pastes, dusting agents, broadcasting agents or granules, by spraying, nebulizing, dusting, broadcasting or pouring, or for seed dressing or mixing with the seed. The application forms depend on the intended uses; they 30 should in any case ensure very fine distribution of the active ingredients according to the invention.

The herbicidal compositions comprise a herbicidally effective amount of at least one active compound of the formula I and 35 auxiliaries which are usually used in formulating crop protection agents.

Suitable inert auxiliaries are essentially: mineral oil fractions having a medium to high boiling point, such 40 as kerosine and diesel oil, and coal tar oils and oils of vegetable or animal origin, aliphatic, cyclic and aromatic hydrocarbons, for example paraffins, tetrahydronaphthalene, alkylated naphthalenes and derivatives thereof, alkylated benzenes and derivatives thereof, alcohols, such as methanol, 45 ethanol, propanol, butanol and cyclohexanol, ketones, such as

cyclohexanone, and strongly polar solvents, for example amines, such as N-methylpyrrolidone, and water.

- Aqueous application forms can be prepared from emulsion
- 5 concentrates, from suspensions, pastes, wettable powders or water-dispersible granules by adding water. For the preparation of emulsions, pastes or oil dispersions, the 1-phenylpyrrolidin-2-onecarboxamides I, as such or dissolved in an oil or solvent, can be homogenized in water by means of wetting agents,
 - 10 adherents, dispersants or emulsifiers. However, it is also possible to prepare concentrates which consist of active ingredient, wetting agent, adherent, dispersant or emulsifier and possibly solvent or oil, which are suitable for dilution with water.
 - 15 Suitable surfactants are the alkali metal, alkaline earth metal and ammonium salts of aromatic sulfonic acids, e.g. lignin-, phenol-, naphthalene- and dibutyl-naphthalenesulfonic acid, and of fatty acids, alkylsulfonates and alkylarylsulfonates, alkyl
 - 20 sulfates, lauryl ether sulfates and fatty alcohol sulfates, and salts of sulfated hexa-, hepta- and octadecanols and of fatty alcohol glycol ether, condensates of sulfonated naphthalene and its derivatives with formaldehyde, condensates of naphthalene or of naphthalenesulfonic acids with phenol and formaldehyde,
 - 25 polyoxyethylene octylphenol ether, ethoxylated isooctyl-, octyl- or nonylphenol, alkylphenyl polyglycol ether, tributylphenyl polyglycol ether, alkylaryl polyether alcohols, isotridecyl alcohol, fatty alcohol/ethylene oxide condensates, ethoxylated castor oil, polyoxyethylene alkyl ethers or polyoxypropylene
 - 30 alkyl ethers, lauryl alcohol polyglycol ether acetate, sorbitol esters, lignosulfite waste liquors and methylcellulose.

- Powders, broadcasting agents and dusting agents can be prepared by mixing or milling the active ingredients together with a solid
- 35 carrier.

- Granules, for example coated, impregnated and homogeneous granules, can be prepared by binding the active ingredients to solid carriers. Solid carriers are mineral earths, such as
- 40 silicas, silica gels, silicates, talc, kaolin, limestone, lime, chalk, bole, loess, clay, dolomite, diatomaceous earth, calcium sulfate, magnesium sulfate, magnesium oxide, milled plastics, fertilizers, such as ammonium sulfate, ammonium phosphate, ammonium nitrate and ureas, and vegetable products, such as grain
 - 45 flour, bark meal, wood meal and nutshell meal, cellulosic powders and other solid carriers.

The concentrations of the active ingredients I in the ready-to-use formulations may be varied within wide ranges. In general, the formulations comprise from about 0.001 to 98, preferably from 0.01 to 95, % by weight of at least one active ingredient I. The active ingredients are used in a purity of from 90 to 100 %, preferably from 95 to 100 % (according to the NMR spectrum).

The compounds I according to the invention can be formulated, for example, as follows:

- I. 20 parts by weight of a compound I are dissolved in a mixture which consists of 80 parts by weight of alkylated benzene, 10 parts by weight of the adduct of from 8 to 10 mol of ethylene oxide with 1 mol of N-monoethanololeamide, 5 parts by weight of the calcium salt of dodecylbenzenesulfonic acid and 5 parts by weight of the adduct of 40 mol of ethylene oxide with 1 mol of castor oil. By pouring the solution into 100,000 parts by weight of water and finely distributing it therein, an aqueous dispersion which comprises 0.02% by weight of the active ingredient is obtained.
- II. 20 parts by weight of a compound I are dissolved in a mixture which consists of 40 parts by weight of cyclohexanone, 30 parts by weight of isobutanol, 20 parts by weight of the adduct of 7 mol of ethylene oxide with 1 mol of isooctylphenol and 10 parts by weight of the adduct of 40 mol of ethylene oxide with 1 mol of castor oil. By pouring the solution into 100,000 parts by weight of water and finely distributing it therein, an aqueous dispersion which comprises 0.02% by weight of the active ingredient is obtained.
- III. 20 parts by weight of a compound I are dissolved in a mixture which consists of 25 parts by weight of cyclohexanone, 65 parts by weight of a mineral oil fraction boiling within the range from 210 to 280°C and 10 parts by weight of the adduct of 40 mol of ethylene oxide with 1 mol of castor oil. By pouring the solution into 100,000 parts by weight of water and finely distributing it therein, an aqueous dispersion which comprises 0.02% by weight of the active ingredient is obtained.
- IV. 20 parts by weight of a compound I are thoroughly mixed with 3 parts by weight of the sodium salt of diisobutyl-naphthalene- α -sulfonic acid, 17 parts by weight

of the sodium salt of a lignosulfonic acid obtained from a sulfite waste liquor and 60 parts by weight of silica gel powder, and the mixture is milled in a hammer mill. By finely distributing the mixture in 20,000 parts by weight of water, a spray liquor which comprises 0.1% by weight of the active ingredient is obtained.

V. 3 parts by weight of a compound I are mixed with 97 parts by weight of finely divided kaolin. A dusting agent which comprises 3% by weight of the active ingredient is obtained in this manner.

VI. 20 parts by weight of a compound I are thoroughly mixed with 2 parts by weight of the calcium salt of dodecylbenzenesulfonic acid, 8 parts by weight of fatty alcohol polyglycol ether, 2 parts by weight of sodium salt of a phenol/urea/formaldehyde condensate and 68 parts by weight of a paraffinic mineral oil. A stable oily dispersion is obtained.

VII. 1 part by weight of a compound I is dissolved in a mixture which consists of 70 parts by weight of cyclohexanone, 20 parts by weight of ethoxylated isooctylphenol and 10 parts by weight of ethoxylated castor oil. A stable emulsion concentrate is obtained.

VIII. 1 part by weight of a compound I is dissolved in a mixture which consists of 80 parts by weight of cyclohexanone and 20 parts by weight of Wettol[®] EM31 (= nonionic emulsifier based on ethoxylated castor oil; BASF AG). A stable emulsion concentrate is obtained.

The active compounds I or the herbicidal compositions can be applied by the preemergence or postemergence method. The herbicidal compositions or active compounds can also be applied by sowing crop seed which has been pretreated with the herbicidal compositions or active compounds. If the active ingredients are less well tolerated by certain crops, it is possible to use application methods in which the herbicidal compositions are sprayed with the aid of the sprayers in such a way that the leaves of the sensitive crops are as far as possible not affected, while the active compounds reach the leaves of undesirable plants growing underneath or the uncovered soil surface (post-directed, lay-by).

The application rates of active compound I are from 0.001 to 3.0, preferably from 0.01 to 1.0, kg/ha of active ingredient (a.i.),

depending on the aim of control, the season, the target plants and the state of growth.

In order to broaden the action spectrum and to achieve

5 synergistic effects, the compounds I according to the invention may be mixed with many members of other groups of herbicidal or growth-regulating active ingredients and applied together with them.

- 10 Examples of suitable components of the mixture are
 1,2,4-thiadiazoles, 1,3,4-thiadiazoles, amides, aminophosphoric acid and derivatives thereof, aminotriazoles, anilides, aryloxy-/hetaryloxyalkanoic acids and derivatives thereof, benzoic acid and derivatives thereof, benzothiadiazinones,
 15 2-(hetaroyl/aroyl)-1,3-cyclohexanediones, hetarylarylketones, benzylisoxazolidinones, meta-CF₃-phenyl derivatives, carbamates, quinolinecarboxylic acid and derivatives thereof, chloroacetanilides, cyclohexane-1,3-dione derivatives, diazines, dichloropropionic acid and derivatives thereof,
 20 dihydrobenzofurans, dihydrofuran-3-ones, dinitroanilines, dinitrophenols, diphenyl ethers, dipyridyls, halocarboxylic acids and derivatives thereof, ureas, 3-phenyluracils, imidazoles, imidazolinones, N-phenyl-3,4,5,6-tetrahydrophthalimides, oxadiazoles, oxiranes, phenols, aryloxy- and
 25 heteroaryloxyphenoxypropionic esters, phenylacetic acid and derivatives thereof, 2-phenylpropionic acid and derivatives thereof, pyrazoles, phenylpyrazoles, pyridazines, pyridinecarboxylic acid and derivatives thereof, pyrimidyl ethers, sulfonamides, sulfonylureas, triazines, triazinones,
 30 triazolinones, triazolcarboxamides and uracils.

It may also be useful to apply the compounds I together, alone or in combination with other herbicides, also as a mixture with further crop-protection agents, for example with pesticides or
 35 agents for controlling phytopathogenic fungi or bacteria. The miscibility with mineral salt solutions which are used for eliminating nutrient and trace element deficiencies is also of interest. Nonphytotoxic oils and oil concentrates can also be added.

40

The examples below are intended to illustrate the invention without limiting it.

45

Preparation examples

The products were characterized by HPLC/MS (high performance liquid chromatography/mass spectrometry), by ^1H -NMR spectroscopy or by their melting point.

HPLC column: RP-18 column (Chromolith Speed ROD from Merck KGaA, Germany).

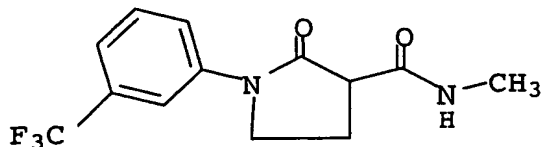
10 Mobile phase: acetonitrile + 0.1% trifluoroacetic acid (TFA)/water + 0.1% TFA in a gradient from 5:95 to 95:5 over 5 minutes, at 40°C.

MS: quadrupole electrospray ionization, 80 V (positive mode)

15

Example 1: 1-(3-trifluoromethyl)phenyl-3-(N-methyl)carboxamido-2-pyrrolidinone

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1.1: 1-(3-trifluoromethyl)phenyl-2-pyrrolidinone

54 g (0.34 mol) of 3-trifluoromethylaniline, 110 ml of butyrolactone and 5 ml of concentrated hydrochloric acid were heated at reflux for 13 hours. Excess butyrolactone was then removed under reduced pressure. The resulting crystalline residue was washed initially with an aqueous sodium bicarbonate solution and then with water and subsequently with pentane. Drying gave 65.5 g (85% of theory) of 1-(3-trifluoromethyl)phenyl-2-pyrrolidinone.

30

^1H -NMR (270 MHz, CDCl_3) δ (ppm): 7.85 (m, 2H), 7.45 (t, 1H), 7.4 (d, 1H), 3.85 (t, 2H), 2.6 (t, 2H), 2.2 (qu, 2H).

35

1.2: 2-oxo-1-(3-trifluoromethyl)phenyl-3-pyrrolidinecarboxylic acid
40 acid

Under nitrogen, 50 ml of absolute tetrahydrofuran were added to 13.6 g (0.06 mol) of 1-(3-trifluoromethyl)phenyl-2-pyrrolidinone from 1.1, the mixture was cooled to 0°C and 60 ml of 2M (0.12 mol) lithium diisopropylamide in a solvent mixture of heptane, tetrahydrofuran and ethylbenzene were added. The reaction mixture was stirred at 0°C for 45 minutes. 5.4 g (0.06 mol) of dimethyl

45

carbonate in 10 ml of absolute tetrahydrofuran were then added. After the addition had ended, the reaction mixture was allowed to warm to 20°C and stirred for another 72 hours. The solvent was evaporated under reduced pressure and methyl tert-butyl ether and water were then added to the resulting residue, the phases were separated and the organic phase was extracted twice with water. The aqueous phase was acidified with hydrochloric acid (10% by weight) to pH = 1. The mixture was extracted twice with in each case 100 ml of ethyl acetate and the combined organic phase was dried and concentrated under reduced pressure. This gave 5.61 g (34% of theory) of 2-oxo-1-(3-trifluoromethyl)phenyl-3-pyrrolidinecarboxylic acid of melting point 121°C.

¹H-NMR (400 MHz, CDCl₃) δ (ppm): 7.9 (s, 1H), 7.8 (d, 1H), 7.5 (t, 1H), 7.45 (d, 1H), 4.1 – 3.9 (m, 2H), 3.7 (t, 1H), 2.55 (m, 2H).

15

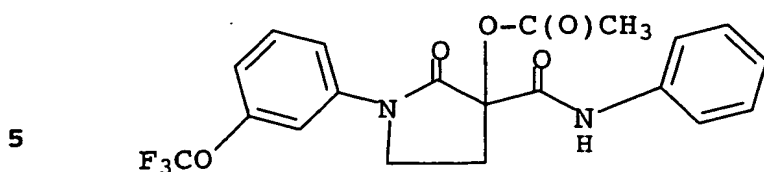
1.3: 1-(3-trifluoromethyl)phenyl-3-(N-methyl)carboxamido-2-pyrrolidinone

0.14 g (1.8 mmol) of a 40% strength aqueous methylamine solution was added to 0.5 g (1.8 mmol) of 2-oxo-1-(3-trifluoromethyl)phenyl-3-pyrrolidinecarboxylic acid from 1.2 in 50 ml of dichloromethane and 0.35 g (2 mmol) of 1,1'-carbonyldiimidazole. The reaction mixture was stirred at room temperature for 18 hours. The reaction mixture was extracted with saturated aqueous ammonium chloride solution and the organic phase was then extracted with water. The organic phase was dried over anhydrous sodium sulfate, the solvent was removed under reduced pressure and the residue that remained was then titrated with methyl tert-butyl ether. The insoluble fraction was then separated off, and the residue was washed with methyl tert-butyl ether. This gave 0.166 g (32% of theory) of the title compound of melting point 128°C.

¹H-NMR (400 MHz, CDCl₃) δ (ppm): 7.9 (s, 1H), 7.75 (d, 1H), 7.5 (t, 1H), 7.4 (d, 1H), 7.3 – 7.2 (br, 1H), 4.0 – 3.8 (m, 2H), 3.5 (t, 1H), 2.9 (d, 3H), 2.75 – 2.6 (m, 1H), 2.55 – 2.45 (m, 1H).

Example 2:

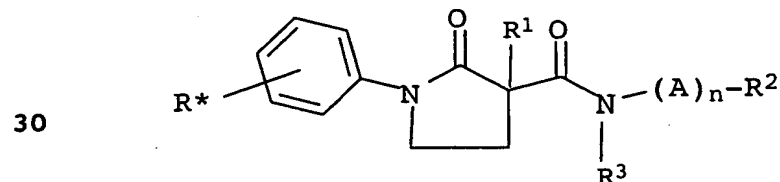
1-(3-trifluoromethoxy)phenyl-3-acetyloxy-3-(N-phenyl)carboxamido-2-pyrrolidinone



0.34 g (0.93 mmol) of 1-(3-trifluoromethoxy)phenyl-3-(N-phenyl)-
 10 carboxamido-2-pyrrolidinone, prepared analogously to Example 1
 using the starting material 3-trifluoromethoxyaniline, was
 initially charged in 3 ml of dry dimethylformamide (DMF), and
 0.04 g (0.093 mmol) of sodium hydride (60% in mineral oil) was
 added at 20°C. The mixture was then stirred at 20°C for 30 min,
 15 0.07 g (0.093 mmol) of acetyl chloride was then added and the
 mixture was stirred at 20°C for another 18 h. Water was added and
 the mixture was extracted repeatedly with dichloromethane. The
 combined organic phases were washed with water, the solvent was
 removed and the residue was chromatographed. This gave 0.27 g of
 20 the title compound of melting point 140°C.

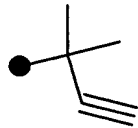
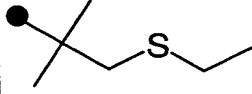
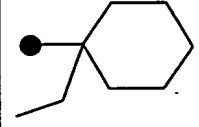
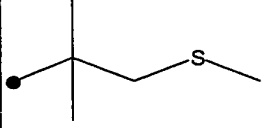
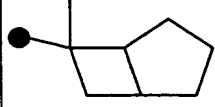
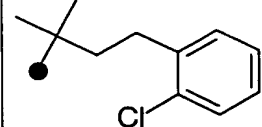
The compounds of Examples 3 to 191 were prepared in an analogous
 manner:

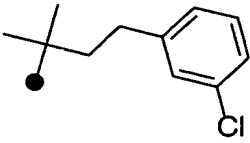
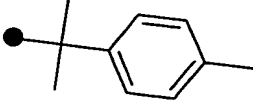
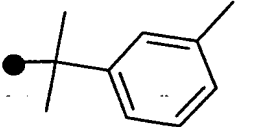
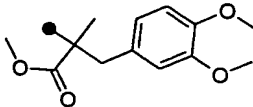
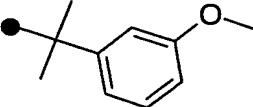
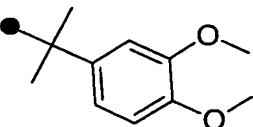
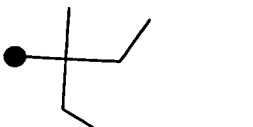
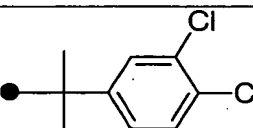
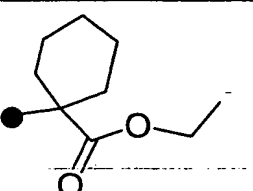

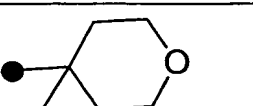
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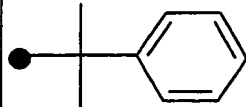
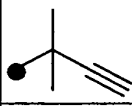
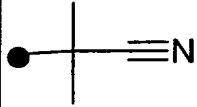
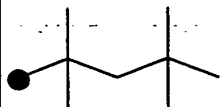
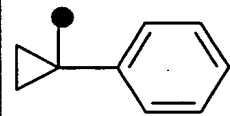
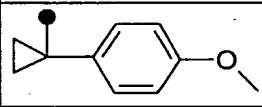
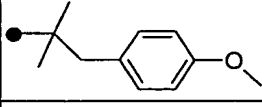
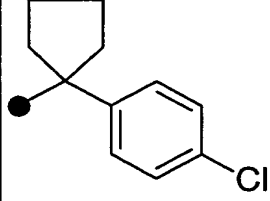
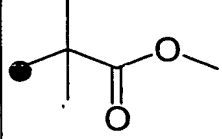
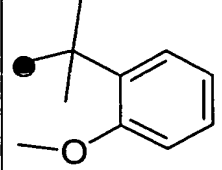
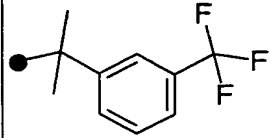


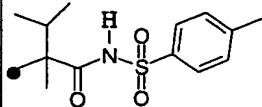
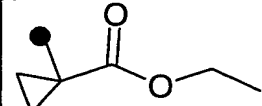
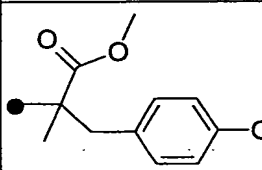
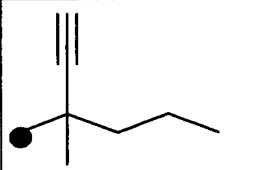
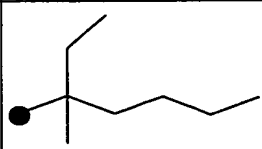
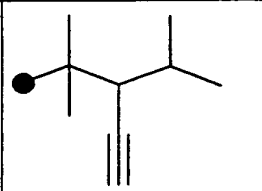
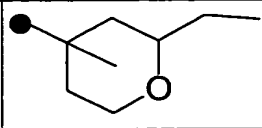
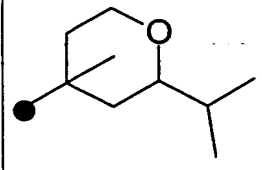
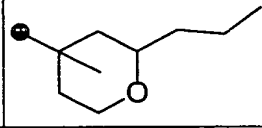
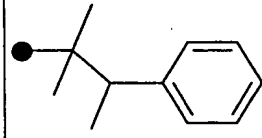
35	Ex- am- ple	(A) _n	R*	R ¹	R ²	R ³	m.p. [°C] or RT (HPLC/MS)
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	2	-	3-OCF ₃	OC(O)CH ₃	phenyl	H	140
40	3	-	3-CF ₃	H	ethyl	H	122
	4	-	3-CF ₃	H	n-propyl	H	112
	5	-	3-CF ₃	H	n-butyl	H	111
	6	-	3-CF ₃	H	tert-butyl	H	oil
45	7	-	3-CF ₃	H	cyclopentyl	H	oil
	8	-	3-CF ₃	H	ethyl	ethyl	oil
	9	-	3-CF ₃	H	methyl	n-butyl	oil

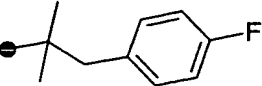
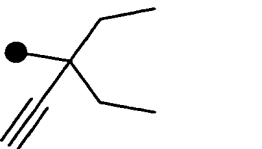
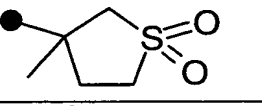
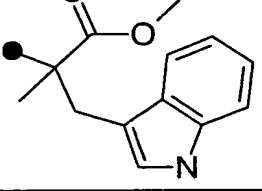
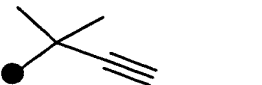
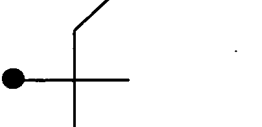
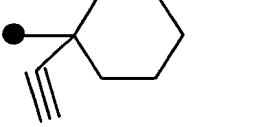
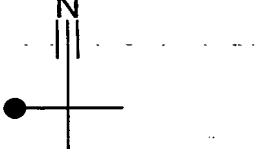
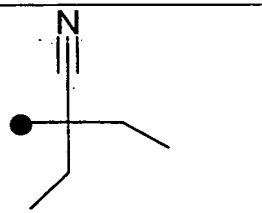
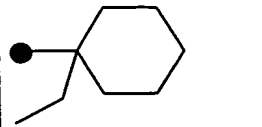
	Ex- am- ple	(A) _n	R*	R ¹	R ²	R ³	m.p. [°C] or RT (HPLC/MS)
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	11	-	3-CF ₃	H	CH(CH ₃) ₂	H	136
	12	-	3-CF ₃	H	cyclohexyl	H	141
	13	-	3-CF ₃	H	CH ₂ -cyclopropyl	H	108
	14	-	3-CF ₃	H	cyclopropyl	H	oil
10	15	-	3-CF ₃	H	methyl	methyl	oil
	16	-	3-CF ₃	H	cyclopropyl	methyl	oil
	17	O	3-CF ₃	H	t-butyl	H	122
	18	-	3-OCF ₃	H	methyl	H	103
15	19	-	3-OCF ₃	H	ethyl	H	111
	20	-	3-OCF ₃	H	n-propyl	H	110
	21	-	3-OCF ₃	H	tert-butyl	H	89
	22	-	3-OCF ₃	H	cyclopentyl	H	140
20	23	-	3-OCF ₃	H	methyl	n-butyl	oil
	24	-	3-OCF ₃	H	phenyl	H	108
	25	-	3-OCF ₃	H	CH(CH ₃) ₂	H	134
	26	-	3-OCF ₃	H	cyclopropyl	H	134
25	27	-	3-OCF ₃	H	methyl	methyl	oil
	28	-	3-OCF ₃	H	H	H	106
	29	O	3-OCF ₃	H	H	H	124
	30	-	3-OCF ₃	OC(O)CH ₃	cyclopentyl	H	oil
30	31	O	3-OCF ₃	H	methyl	H	98
	32	-	3-OCF ₃	CH ₃	tert-butyl	H	40
	33	O	3-OCF ₃	H	CH ₂ -phenyl	H	108
	34	O	3-OCF ₃	H	methyl	methyl	oil
	35	O	3-OCF ₃	H	CH(CH ₃) ₂	H	123
35	36	O	3-OCF ₃	H	CH ₂ CH=CH ₂	H	75
	37	O	3-OCF ₃	H	CH ₂ C(Cl)=CH ₂	H	68
	38	O	3-OCF ₃	H	CH ₂ CH ₂ CH ₂		29
40	39	O	3-OCF ₃	H	CH ₂ CH=CHCH ₃	H	87
	40	O	3-OCF ₃	H	CH ₂ CH=CHCl	H	62
	41	O	3-OCF ₃	H	CH ₂ CH ₃	H	100
	42	O	3-OCF ₃	H	CH ₂ CH ₂ OCH ₃	H	85
	43	O	3-OCF ₃	H	cylohexyl	H	152
45	44	O	3-OCF ₃	H	CH ₂ -cylohexyl	H	135
	45	-	3-CH(CH ₃) ₂	H	tert-butyl	H	51
	46	-	3-CH(CH ₃) ₂	CH ₃	tert-butyl	H	78
	47	O	3-CF ₃	H	tert-butyl	H	oil

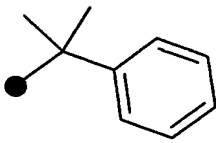
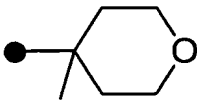
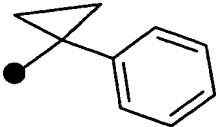
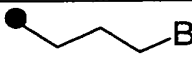
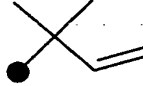

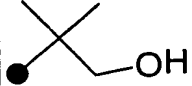
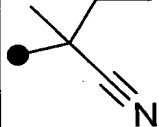
	Ex- am- ple	(A) _n	R*	R ¹	R ²	R ³	m.p. [°C] or RT (HPLC/MS)	
5	48	0	3-OCF ₃	H	tert-butyl	H	112	
	49	-	2-Cl	H	tert-butyl	H	76	
	50	-	3-Cl	H	tert-butyl	H	118	
	51	-	3-Cl; 5-Cl	H	tert-butyl	H	130	
	52	-	2-Cl; 4-Cl	H	tert-butyl	H	93	
10	53	-	2-F	H	tert-butyl	H	113	
	54	-	2-CF ₃	H	tert-butyl	H	90	
	55	-	4-CF ₃	H	tert-butyl	H	155	
	56	-	2-CH ₃	H	tert-butyl	H	93	
	57	-	3-CH ₃	H	tert-butyl	H	88	
15	58	-	4-CH ₃	H	tert-butyl	H	135	
	59	-	2-CH(CH ₃) ₂	H	tert-butyl	H	104	
	60	-	3-OCH ₃	H	tert-butyl	H	43	
	61	-	4-OCH ₃	H	tert-butyl	H	132	
	62	-	2-OCH ₃	H	tert-butyl	H	oil	
20	63	-	2-Cl; 6-Cl	H	tert-butyl	H	oil	
	64	-	2-Cl; 3-Cl	H	tert-butyl	H	oil	
	65	-	4-Cl	H	tert-butyl	H	155	
	25	66	-	3-OCH ₃	H		H	110-112
		67	-	3-OCF ₃	H		H	3.78 min, m/z = 405 [M+H] ⁺
68		-	3-OCF ₃	H		H	4.09 min m/z = 399 [M+H] ⁺	
69		-	3-OCF ₃	H		H	3.62 min m/z = 391 [M+H] ⁺	
70		-	3-OCF ₃	H		H	3.89 min m/z = 397 [M+H] ⁺	
45	71	-	3-OCF ₃	H		H	4.30 min m/z = 469 [M+H] ⁺	

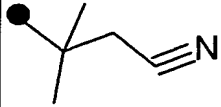
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5 72	-	3-OCF ₃	H		H	4.03 min m/z = 469 [M+H] ⁺
10 73	-	3-OCF ₃	H		H	3.95 min m/z = 443 [M+Na] ⁺
74	-	3-OCF ₃	H		H	3.93 min m/z = 443 [M+Na] ⁺
15 75	-	3-OCF ₃	H		H	3.61 min m/z = 525 [M+H] ⁺
20 76	-	3-OCF ₃	H		H	3.75 min m/z = 459 [M+Na] ⁺
25 77	-	3-OCF ₃	H		H	3.55 min m/z = 489 [M+Na] ⁺
78	-	3-OCF ₃	H		H	3.84 min m/z = 373 [M+H] ⁺
30 79	-	3-OCF ₃	H		H	4.11 min m/z = 498 [M+Na] ⁺
35 80	-	3-OCF ₃	H		H	3.79 min m/z = 443 [M+H] ⁺
40 81	-	3-OCF ₃	H		H	3.88 min m/z = 373 [M+H] ⁺
45 82	-	3-OCF ₃	H		H	3.60 min m/z = 387 [M+H] ⁺

	Ex- am- ple	(A) _n	R*	R ¹	R ²	R ³	m.p. [°C] or RT (HPLC/MS)
5	83	-	3-OCF ₃	H		H	3.80 min m/z = 429 [M+Na] ⁺
	84	-	3-OCF ₃	H		H	3.37 min m/z = 355 [M+H] ⁺
10	85	-	3-OCF ₃	H		H	3.17 min m/z = 356 [M+H] ⁺
	86	-	3-OCF ₃	H		H	4.20 min m/z = 401 [M+H] ⁺
20	87	-	3-OCF ₃	H		H	3.55 min m/z = 405 [M+H] ⁺
	88	-	3-OCF ₃	H		H	3.52 min m/z = 435 [M+H] ⁺
25	89	-	3-OCF ₃	H		H	3.91 min m/z = 451 [M+H] ⁺
	90	-	3-OCF ₃	H		H	4.20 min m/z = 491 [M+Na] ⁺
35	91	-	3-OCF ₃	H		H	3.18 min m/z = 389 [M+H] ⁺
	92	-	3-OCF ₃	H		H	3.85 min m/z = 460 [M+Na] ⁺
45	93	-	3-OCF ₃	H		H	4.03 min m/z = 475 [M+H] ⁺

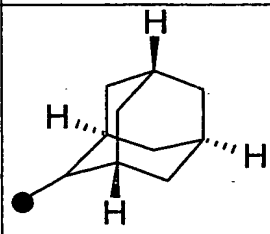
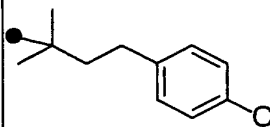
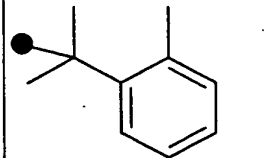
	Ex- am- ple	(A) _n	R*	R ¹	R ²	R ³	m.p. [°C] or RT (HPLC/MS)
5	94	-	3-OCF ₃	H		H	3.82 min m/z = 579 [M+Na] ⁺
	95	-	3-OCF ₃	H		H	3.19 min m/z = 401 [M+H] ⁺
10	96	-	3-OCF ₃	H		H	3.32 min m/z = 481 [M+H] ⁺
15	97	-	3-OCF ₃	H		H	3.75 min m/z = 383 [M+H] ⁺
20	98	-	3-OCF ₃	H		H	4.26 min m/z = 401 [M+H] ⁺
25	99	-	3-OCF ₃	H		H	4.06 min m/z = 411 [M+H] ⁺
30	100	-	3-OCF ₃	H		H	3.54 min m/z = 415 [M+H] ⁺
35	101	-	3-OCF ₃	H		H	3.79 min m/z = 429 [M+H] ⁺
40	102	-	3-OCF ₃	H		H	3.77 min m/z = 429 [M+H] ⁺
45	103	-	3-OCF ₃	H		H	4.09 min m/z = 435 [M+H] ⁺

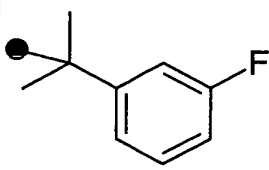
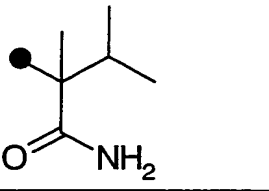
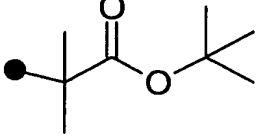
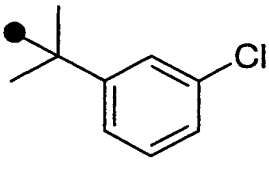
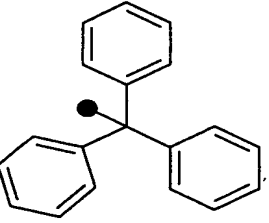
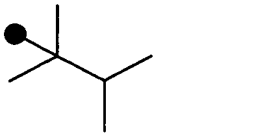
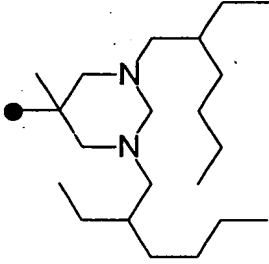
	Ex- am- ple	(A) _n	R*	R ¹	R ²	R ³	m.p. [°C] or RT (HPLC/MS)
5	104	-	3-OCF ₃	H		H	3.98 min m/z = 439 [M+H] ⁺
	105	-	3-OCF ₃	H		H	3.75 min m/z = 383 [M+H] ⁺
10	106	-	3-OCF ₃	H		H	2.93 min m/z = 421 [M+H] ⁺
	107	-	3-OCF ₃	H		H	3.63 min m/z = 504 [M+H] ⁺
20	108	-	3-OCHF ₂	H	phenyl	H	104
	109	-	3-OCHF ₂	H		H	80
	110	-	3-OCHF ₂	H	tert-butyl	H	64
25	111	-	3-OCHF ₂	H		H	oil
	112	-	3-OCHF ₂	H		H	153
35	113	-	3-OCHF ₂	H		H	oil
	114	-	3-OCHF ₂	H		H	oil
45	115	-	3-OCHF ₂	H		H	48

	Ex- am- ple	(A) _n	R*	R ¹	R ²	R ³	m.p. [°C] or RT (HPLC/MS)
5	116	-	3-OCHF ₂	H		H	oil
	117	-	3-OCHF ₂	H		H	82
10	118	-	3-OCHF ₂	H		H	oil
	119	-	3-OCHF ₂	H	CH ₃	H	74
15	120	-	3-OCHF ₂	H	ethyl	H	70
	121	-	3-OCHF ₂	H	isopropyl	H	126
20	122	-	3-OCHF ₂	H	cyclopropyl	H	130
	123	-	4-CH=C(Cl) ₂	H	tert-butyl	H	166-167
25	124	-	3-CF ₃ ; 5-CF ₃	H	tert-butyl	H	135-136
	125	-	4-SCH ₃	H	tert-butyl	H	166-167
30	126	-	4-CH(CH ₃) ₂	H	tert-butyl	H	130-131
	127	-	4-OCHF ₂	H	tert-butyl	H	152-153
35	128	-	3-Cl; 4-Cl; 5-Cl	H	tert-butyl	H	160-163
	129	-	3-Br; 5-Br	H	tert-butyl	H	140-141
40	130	-	4-NO ₂ ; 5-Cl	H	tert-butyl	H	152-153
	131	-	4-OCF ₂ CF ₃	H	tert-butyl	H	66-67
45	132	-	3-OCF ₃	H		H	oil
	133	-	3-OCF ₃	H		H	3.51 min m/z = 357 [M+H] ⁺
50	134	-	3-OCF ₃	H		H	3.67 min m/z = 359 [M+H] ⁺
	135	-	3-OCF ₃	H		H	2.92 min m/z = 361 [M+H] ⁺
55	136	-	3-OCF ₃	H		H	3.31 min m/z = 370 [M+H] ⁺

	Ex- am- ple	(A) _n	R*	R ¹	R ²	R ³	m.p. [°C] or RT (HPLC/MS)
5	137	-	3-OCF ₃	H		H	3.23 min m/z = 370 [M+H] ⁺
	138	-	3-CF ₃ ; 4-Cl	H	tert-butyl	H	3.65 min m/z = 363 [M+H] ⁺
10	139	-	3-OCH ₃ ; 5-OCH ₃	H	tert-butyl	H	2.87 min m/z = 321 [M+H] ⁺
15	140	-	3-SCH ₃	H	tert-butyl	H	3.14 min m/z = 307 [M+H] ⁺
	141	-	3-tert-bu- tyl	H	tert-butyl	H	3.62 min m/z = 317 [M+H] ⁺
20	142	-	O-CH(CH ₃) ₂	H	tert-butyl	H	3.24 min m/z = 319 [M+H] ⁺
	143	-	3-F; 4-F	H	tert-butyl	H	3.07 min m/z = 297 [M+H] ⁺
25	144	-	3-OCH ₃ ; 4-OCH ₃ ; 5-OCH ₃	H	tert-butyl	H	2.64 min m/z = 351 [M+H] ⁺
	145	-	4-propyl	H	tert-butyl	H	3.53 min m/z = 303 [M+H] ⁺
30	146	-	4-O-tert- butyl	H	tert-butyl	H	3.36 min m/z = 333 [M+H] ⁺
	147	-	3-Cl; 4-F	H	tert-butyl	H	3.26 min m/z = 313 [M+H] ⁺
35	148	-	4-O-propyl	H	tert-butyl	H	3.67 min m/z = 319 [M+H] ⁺
	149	-	4-Br	H	tert-butyl	H	3.19 min m/z = 339 [M+H] ⁺
40	150	-	4-SCH ₂ CH ₃	H	tert-butyl	H	3.32 min m/z = 321 [M+H] ⁺
	151	-	3-Br; 4-OCH ₃ ; 5-Cl	H	tert-butyl	H	3.49 min m/z = 405 [M+H] ⁺
45	152	-	3-Cl; 4-O-propyl	H	tert-butyl	H	3.58 min m/z = 353 [M+H] ⁺

	Ex- am- ple	(A) _n	R*	R ¹	R ²	R ³	m.p. [°C] or RT (HPLC/MS)
5	153	-	3-F; 4-NO ₂	H	tert-butyl	H	2.97 min m/z = 324 [M+H] ⁺
	154	-	3-Br; 5-Br; 4-Cl	H	tert-butyl	H	3.86 min m/z = 452 [M+H] ⁺
10	155	-	3-ethyl; 5-CH ₃	H	tert-butyl	H	3.47 min m/z = 303 [M] ⁺
	156	-	3-CH ₃ ; 5-CH ₃	H	tert-butyl	H	3.22 min m/z = 289 [M+H] ⁺
15	157	-	3-Br	H	tert-butyl	H	3.21 min m/z = 341 [M+H] ⁺
	158	-	3-ethyl	H	tert-butyl	H	3.23 min m/z = 289 [M+H] ⁺
20	159	-	3-iso- propyl; 4-OCH ₃	H	tert-butyl	H	3.46 min m/z = 333 [M+H] ⁺
	160	-	3,4 -OCH ₂ CH ₂ O-	H	tert-butyl	H	2.66 min m/z = 319 [M+H] ⁺
25	161	-	4-CN	H	tert-butyl	H	2.74 min m/z = 286 [M+H] ⁺
	162	-	3-CN; 4-OCH ₃	H	tert-butyl	H	2.74 min m/z = 316 [M+H] ⁺
30	163	-	3-CN; 4-F	H	tert-butyl	H	2.79 min m/z = 304 [M+H] ⁺
	164	-	3-F; 4-CH ₃	H	tert-butyl	H	3.22 min m/z = 293 [M+H] ⁺
35	165	-	3-CN; 4-Cl	H	tert-butyl	H	3.09 min m/z = 320 [M+H] ⁺
	166	-	3-Cl; 4-Cl	H	tert-butyl	H	3.53 min m/z = 329 [M] ⁺
40	167	-	3-CH ₃ ; 4-F	H	tert-butyl	H	3.11 min m/z = 293 [M+H] ⁺
	168	-	3-Cl; 4-OCH ₃	H	tert-butyl	H	3.06 min m/z = 325 [M+H] ⁺

	Ex- am- ple	(A) _n	R*	R ¹	R ²	R ³	m.p. [°C] or RT (HPLC/MS)
5	169	-	4-heptyl	H	tert-butyl	H	4.50 min m/z = 359 [M+H] ⁺
	170	-	4-tert-butyl	H	tert-butyl	H	3.73 min m/z = 317 [M+H] ⁺
10	171	-	4-ethyl	H	tert-butyl	H	3.32 min m/z = 289 [M+H] ⁺
	172	-	3-Cl; 4-iso-propyl	H	tert-butyl	H	3.82 min m/z = 337 [M+H] ⁺
15	173	-	3-Cl; 4-CH ₃	H	tert-butyl	H	3.45 min m/z = 309 [M] ⁺
	174	-	3-F	H	tert-butyl	H	3.96 min m/z = 279 [M+H] ⁺
20	175	-	3-CH ₃ ; 5-prdpyl	H	tert-butyl	H	94-96
	176	-	3-ethyl; 5-ethyl	H	tert-butyl	H	120-122
	177	-	3-O-ethyl	H	tert-butyl	H	86-88
25	178	-	3-OCH ₃ ; 4-Br	H	tert-butyl	H	150-152
	179	-	3-OCH ₃ ; 4-Cl	H	tert-butyl	H	137-139
30	180	-	3-Cl; 4-SCF ₃	H	tert-butyl	H	3.86 min m/z = 395 [M+H] ⁺
	181	-	4-F	H	tert-butyl	H	2.77 min m/z = 278 [M+H] ⁺
35	182	-	3-OCF ₃	H		H	4.16 min m/z = 423 [M+H] ⁺
40	183	-	3-OCF ₃	H		H	4.31 min m/z = 469 [M+H] ⁺
45	184	-	3-OCF ₃	H		H	3.87 min m/z = 443 [M+H] ⁺

Ex- am- ple	(A) _n	R*	R ¹	R ²	R ³	m.p. [°C] or RT (HPLC/MS)
5 185	-	3-OCF ₃	H		H	3.76 min m/z = 447 [M+Na] ⁺
10 186	-	3-OCF ₃	H		H	3.00 min m/z = 402 [M+H] ⁺
15 187	-	3-OCF ₃	H		H	3.75 min m/z = 453 [M+Na] ⁺
20 188	-	3-OCF ₃	H		H	3.94 min m/z = 463 [M+Na] ⁺
25 189	-	3-OCF ₃	H		H	4.42 min m/z = 553 [M+Na] ⁺
30 190	-	3-OCF ₃	H		H	3.85 min m/z = 473 [M+Na] ⁺
35 191	-	3-OCF ₃	H		H	4.49 min m/z = 611 [M+Na] ⁺

* The number in front of the substituent denotes the position of
45 the substituent on the phenyl ring.

• Attachment site

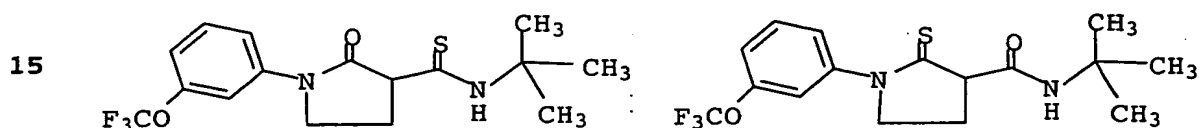
RT = retention time, HPLC/MS

m.p. = melting point

5 phenyl = C₆H₅

Example 192:

1-(3-trifluoromethoxy)phenyl-3-(N-(1,1-dimethylethyl))carbox-
10 amido-2-pyrrolidinethione and 1-(3-trifluoromethoxy)phenyl-
3-(N-(1,1-dimethylethyl))thiocarboxamido-2-pyrrolidinone



20 0.26 g (0.7 mmol) of 1-(3-trifluoromethoxy)phenyl-3-(N-(1,1-di-
methylethyl))carboxamido-2-pyrrolidinone was initially charged in
3 ml of dry toluene, and 0.17 g (0.42 mmol) of 2,4-bis(4-methoxy-
phenyl)-1,3-dithia-2,4-diphosphetane-2,4- dithione (Lawesson's
reagent) was added at 20°C, and the mixture was heated at 70°C for
25 7 h. The reaction mixture was then washed twice with water. The
solvent was removed and the residue was chromatographed on silica
gel using a mixture of cyclohexane/ethyl acetate as mobile phase.
A first fraction gave 0.06 g (22%) of
1-(3-trifluoromethoxy)phenyl-3-(N-(1,1-dimethyl-
30 ethyl))thiocarboxamido-2-pyrrolidinone of melting point 65°C and
0.08 g (29%) of 1-(3-trifluoromethoxy)phenyl-3-(N-(1,1-dimethyl-
ethyl))carboxamido-2-pyrrolidinethione of melting point 116°C.

Use examples

35

The herbicidal activity of the 1-phenylpyrrolidon-2-one-
3-carboxamides of the formula I was demonstrated by the following
greenhouse experiments:

40 The cultivation containers used were plastic flowerpots
containing loamy sand with approximately 3.0% of humus as the
substrate. The seeds of the test plants were sown separately for
each species.

45 For the preemergence treatment, directly after sowing the active
compounds, which had been suspended or emulsified in water, were
applied by means of finely distributing nozzles. The containers

were irrigated gently to promote germination and growth and subsequently covered with transparent plastic hoods until the plants had rooted. This cover causes uniform germination of the test plants, unless this was adversely affected by the active
5 compounds.

For the postemergence treatment, the test plants were first grown to a height of 3-15 cm, depending on the plant habit, and only then treated with the active compounds which had been suspended
10 or emulsified in water. The test plants were for this purpose either sown directly and grown in the same containers, or they were first grown separately as seedlings and transplanted into the test containers a few days prior to the treatment. The application rate for the pre- and postemergence treatment was
15 3.0 kg of a.i./ha.

Depending on the species, the plants were kept at 10 - 25°C or 20 - 35°C. The test period extended over 2 to 4 weeks. During this time, the plants were tended, and their response to the
20 individual treatments was evaluated.

Evaluation was carried out using a scale from 0 to 100. 100 means no emergence of the plants, or complete destruction of at least the above-ground parts, and 0 means no damage, or normal course
25 of growth.

The plants used in the greenhouse experiments were of the following species:

30 Bayer code	Common name
ABUTH	Velvetleaf
AVEFA	wild Oat
LOLMU	italien Ryegrass
SETIT	Millet
35 SINAL	velvetleaf

At application rates of 3 kg/ha, the compound from Example 3, applied by the post-emergence method, shows very good herbicidal activity against AVEFA and SINAL.

40 At application rates of 3 kg/ha, the compound from Example 18, applied by the post-emergence method, shows very good herbicidal activity against ABUTH, SETIT and SINAL.

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At application rates of 3 kg/ha, the compound from Example 18, applied by the pre-emergence method, shows very good herbicidal activity against ABUTH, SETIT and SINAL.

- 5 At application rates of 3 kg/ha, the compound from Example 19, applied by the pre-emergence method, shows very good herbicidal activity against ABUTH and SINAL.

- 10 At application rates of 3 kg/ha, the compound from Example 26, applied by the post-emergence method, shows very good herbicidal activity against AVEFA and SINAL.

- 15 At application rates of 3 kg/ha, the compound from Example 26, applied by the pre-emergence method, shows very good herbicidal activity against ABUTH, LOLMU and SINAL.

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